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Treatment of Uterine Hemorrhage of Benign Origin with Radium*

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Butte, Mont.

THIS paper is concerned with the treatment of simple menorrhagia, uterine myoma, and myopathetic hemorrhage with radium; the indications for treatment; the technique employed; and the results.

This is one field in which treatment by radium is of the greatest value, and with proper judgment in the selection of patients and with careful technique, the results often surpass those of any other form of treatment. It is interesting to note that this is the first pelvic condition in which radium was applied as a therapeutic agent. The trial was carried out in France, the birthplace of knowledge of the element. In 1906 Oudin and Vérchère reported having treated uterine hemorrhage due to benign lesions by the introduction of 11 mg. of radium element into the uterine cavity, and allowing it to remain in place for fifteen minutes, repeating the treatment five or six times at intervals of four or five days. Filtration was not employed, except that of the glass container, and results were not happy; the beta radiation caused much local reaction, and further work was abandoned.

In this country, Abbé in 1906, reported treating one patient for simple menorrhagia with radium, and later reported two good results with fibroid tumors, in one of which treatment was given in 1905, and in one in 1909. There were then many scattered reports of results, culminating in the paper of Kelly and Burnam, in 1914.

From 1914 on, the literature has been voluminous concerning an adequate type of treatment.

In benign disease of the uterus, the indication for treatment by radium is usually hemorrhage, but the underlying cause of this symptom must be sought. The precise etiology is often obscure. According to the accumlated literature, the most common contributory conditions are hyperplasia or polyposis of the endometrium and uterine fibroid tumors; more rarely, repeated pregnancies, chronic endometritis of low grade, hypertension, fibrosis of the uterine muscle, cervical polyps, ovarian cysts, or blood dyscrasias such as leukemia. When no physical basis for the symptom is found, endocrine imbalance is usually regarded as the causative factor. In planning treatment, the age of the patient, the presence or absence of fibromas and their size if present, the major complaints of the patient, and other conditions and complications associated with menorrhagia are of importance.

In the control of uterine hemorrhage, in cases in which general examination has eliminated endocrine disturbance or blood dyscrasia as an etiologic factor, and in which curettage and microscopic study of the endometrial tissue so obtained have indicated that the disorder is benign, radium is the treatment of choice if certain contraindications given below are respected. In some instances, however, treatment by roentgen rays or by extrauterine applications of radium can be given. Such instances are those in which old chronic pelvic infection complicates the bleeding but in itself is not sufficient to require operation, and those in which a large uterine fibroid is present, but where there is definite contraindication to operation. Hysterectomy, hysterotomy or myomectomy is definitely indicated in a certain group of patients.

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*Read before the Montana State Medical Society, at Helena, Mont., July 3, 1935.

Fibromyomata of the uterus are frequently referred to as fibroids or myomata and are the most frequent of all gynecologic neoplasms. Myomata are present in from 4.3 percent to 20 percent of all gynecologic patients. Many small symptomless myomata are never recognized. In those statistics formulated largely from colored patients, the proportion of myomata is always high. Combined statistics of Frank, Kelly, Cullen, and McDonald, formulated from 2,391 cases, show that 70 percent of patients are between 35 and 50 years of age.

Myomata are relatively infrequent under 30 and rarely require treatment after 55 years of age; however, in my series the youngest individual treated was 23 and the oldest 74, the former being subjected to a hysterectomy, leaving the ovaries, and the later being treated by radium.

All myomata have their origin in the myometrium and from this site may develop inwards and become submucous and even pedunculated; or outwards, subperitoneal or intraligamentous. The subperitoneal variety frequently become pedunculated, and eventually the pedicle may become attenuated or entirely disappear and the tumor become parasitic or wandering, and receive all its nourishment through adhesions from the omentum or adjacent structures; in rare instances, the intraligamentous variety may in the same manner become separated from the uterus. Uterine myomata are usually multiple, tumors of varying sizes being present.

The symptoms produced by myomata are too well known to require description. Hemorrhage and pressure symptoms and symptoms developing from complications such as salpingitis, are among the most frequent. The character and severity of the symptoms are in accord with the lesions present, and as these vary greatly so also do the symptoms. All cases are symptomless in the early stage and some never cause trouble.

In an analysis of 934 cases, Kelly and Cullen found inflammatory lesion of the tubes present in 45 percent.

The diagnosis of uterine myomata is usually not difficult, but the recognition of complications, many of which may be contraindications to irradiation, is often not so easy. An accurate and complete diagnosis is of much more importance if the tumor is to be treated by irradiation than if an abdominal section is to be performed; in the latter case an adnexa, the seat of an inflammatory lesion or the presence of a small ovarian neoplasm does not greatly alter the ultimate outcome, whereas if irradiation is to be performed either of these complications may cause a fatal termination.

The theories which have been advanced to explain the beneficial action of radium upon uterine myomata are: (A) Action upon the ovary and destruction of its follicle-bearing constituents; (B) The production of an endarteritis of the blood vessels of the tumor and myometrium; (C) The increase in amount of fibrous tissue in the neoplasm and myometrium; and (D) The formation of cicatricial tissue in the endometrium. Of these we place the greatest reliance in the theory first mentioned. Doubtless, however, the production of an obliterative endarteritis is a contributing factor. The increase in amount of fibrous tissue is difficult to prove as the proportion of this tissue varies markedly in uteri which have not been subjected to irradiation.

We place little credence upon the theory of cicatricial tissue formation in the endometrium. We have examined several uteri which have been irradiated, and have rarely been able to demonstrate scar tissue except in recent cases. It is necessary to understand the manner in which radium acts in order to make a proper selection of cases suitable for irradiation. In the treatment of these, irradiation should be the hand-maiden to and not necessarily the competitor of surgery. The percentage of fibroid tumors that is suitable for radium varies from the low figure of 30 percent quoted by Miller to that of 70 to 90 percent quoted by Ward; probably two-thirds would be a better estimate.

As far as treatment is concerned, uterine myomata can be divided into three groups: (A) The small, uncomplicated, slow-growing or stationary symptomless myomata, which do not ordinarily require any treatment other than periodic observation; (B) the tumors which are best treated by myomectomy, or hysteromyomectomy, according to the individual case; and (C) cases suitable for irradiation.

Many cases belong to the first group, a considerable number to the second, and about 60 or 70 percent to the third. Perhaps the easiest way to express our views regarding irradiation is by a process of exclusion and to state primarily the contraindications to irradiation.

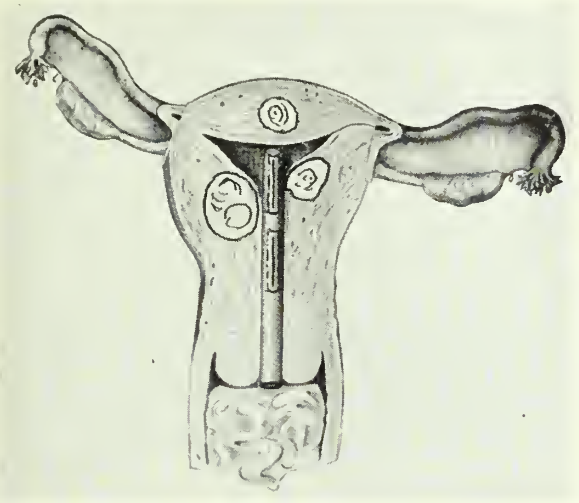

FIGURE 1
Showing the intra-uterine applicator with radium intact.

The indications and contraindications to irradiation will be better understood if we consider the limitations of irradiation. Irradiation may be expected to check uterine bleeding resulting from myomata in practically all cases in which an adequate dosage is employed. Tumor shrinkage or even entire disappearance of the neoplasm, as far as palpable findings are concerned, may also be expected in the majority of cases. This result is not, however, so certain as is the development of amenorrhoea. Furthermore, the shrinkage is usually a slow process involving months and sometimes years. With these facts in mind the following contraindications to use of irradiation are easily explainable. Certain exceptions to these rules may occur:

1. Cases in which doubt exists as to the accuracy of diagnosis.
2. The presence of intraperitoneal lesions other than the myomata which requires surgical intervention.
3. Rapid growth. (usually means it is not a fibroid)
4. Associated neoplasms such as fundal carcinoma or any extra-uterine pelvic tumor such as ovarian tumor.
5. Pressure symptoms. (respond too slowly irradiation)
6. Softening or degeneration of the tumor.
7. Inflammatory lesions within the pelvis, especially inflammation of the adnexa. Inflammatory disease of long standing, whether specific or not, may be activated by the application of radium.
8. When the tumor and uterus is larger than a four months' pregnancy.
9. Large fibromas, with calcareous degeneration, are affected very little by radium.
10. Submucous tumor, especially if pedunculated, because of the possibility of sloughing and secondary hemorrhage, is given by some authorities as a contraindication. In my experience, however, this has not been true.
11. Young patients, who are desirous of children, should never be given over 300 to 600 mg. hours for menorrhagia. In cases of uterine fibroid in young women, which have not been controlled by repeated small doses of radium, myomectomy, or if necessary hysterectomy, with preservation of the ovaries, is preferable, for irradiation may cause artificial menopause with the usual distressing sequelae.
12. Obstructing tumors or malformations which prevent the proper application of the radium.
13. If pain is associated with a pelvic tumor, exploration is advisable, for the pain indicates additional pelvic lesions which should be investigated.
14. Radiophobia; in the eyes of some radium is used only for carcinoma and they shun any idea of irradiation. Strictly speaking, however, this is not a contraindication.

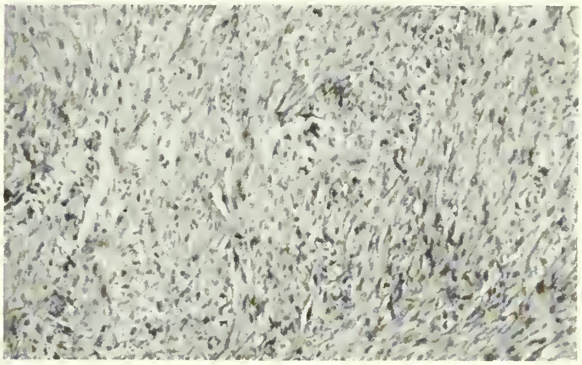

FIGURE 2
Photomicrograph of a uterine myoma. This shows the interlacing bands of muscle fibers; some cut transversely, others cut longitudinally.

From the foregoing it is evident that either myomectomy or hysteromyomectomy is the preferable treatment in many cases. In others, however, irradiation is the method of choice and any different treatment submits the patient to unnecessary risks and certainly does not produce better if as good results. Irradiation is the advisable method in: (A) Small or medium-sized uncomplicated myomata whose chief symptom is hemorrhage; (B) In myopathic hemorrhage; (C) In all cases in which surgery is contraindicated, such as the presence of cardiac, renal or pulmonary disease or other conditions which would make operation unduly hazardous. Graves, Taussig, and others have directed attention to the complications which may follow irradiation; the chief one of these is that there may be a recurrence or continuance of the bleeding. Patients respond differently to irradiation as incidenced by the fact that some tumors apparently disappear whereas others submitted to the same dosage and apparently similar in all respects, do not, or shrink only to a much less extent.

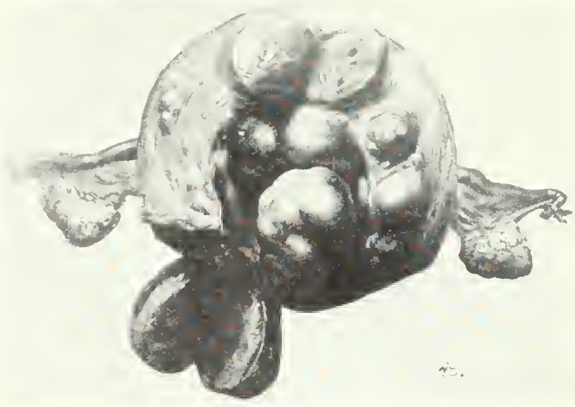

FIGURE 3
Uterus with extensive myomatous involvement, chiefly interstitial and sub-mucous. Note the extreme distortion of the uterine cavity, preventing proper application of radium; consequently, hysteromyomectomy.

After irradiation the uterus and ovaries are still present and a recurrence of bleeding is therefore possible. The same, however, is true in the case of a myomectomy. Clark and Norris state that a little less than five percent of their cases have suffered a recurrence of bleeding sufficient to require a second treatment; the majority of these have been younger women in whom the irradiation dosage has been small. One irradiation by no means contraindicates a second treatment, and a recurrence can be usually cured in this way. Furthermore, intrauterine irradiation in no way mitigates against the success of a subsequent operation although this in my experience has never been necessary. In my series of 150 cases only one case required a second treatment because of hemorrhage.

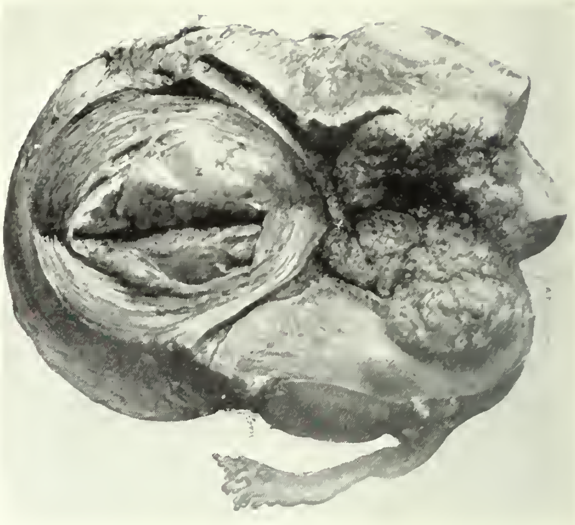

FIGURE 4
Cervical myoma with adenocarcinoma of body. Showing the importance of diagnostic curettage in every case.

Complications

Nausea during the period of irradiation is not infrequent; we believe it is somewhat more frequent than following a simple dilatation and curettage. It is certainly not so frequent, severe or prolonged as generally occurs following a hysterectomy or other intraperitoneal operation. If present it disappears almost uniformly and immediately with the removal of the radium from the uterus. In many cases it is entirely absent and only in rare instances is it severe. Anesthesia, narcotization and the presence of a foreign body within the uterus doubtless account for the majority if not all the cases. In my patients sodium luminal, 5 grs., are given hypodermatically as necessary, and serves to control the nausea and vomiting to a marked degree.

In a small proportion of cases leukorrhoea may be a post-operative complication of irradiation or more frequently a continuance of a previously present leukorrhoea may be observed. This type of leukorrhoea may continue for some weeks following the post-irradiation amenorrhoea. Another complication which occasionally occurs is pia metria, the chief symptoms of which are severe pain in the region of the uterus, with fever and a sudden stopping of the uterine drainage. The condition usually occurs three to four weeks after the radium application, and is more prone to happen in those cases where there is cervical stenosis causing poor drainage from the uterine cavity. The treatment is dilatation and drainage.

The production of irradiation menopause may now be considered. This occurs with about the

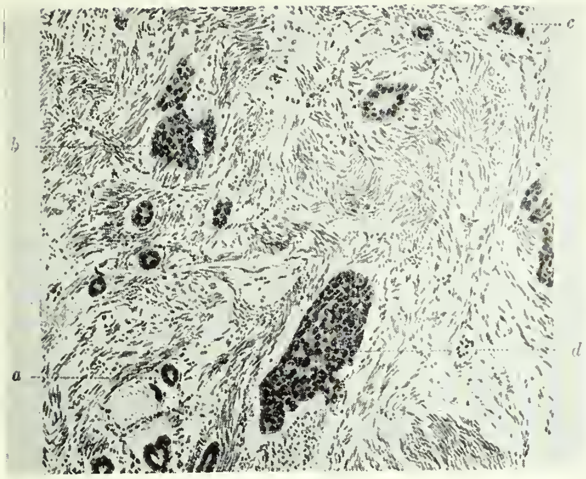

FIGURE 5

A high-power photomicrograph of Figure 4, showing adenocarcinoma involving myoma. Secondary to the body of the uterus. A, B, C and D show carcinomatous cells scattered throughout the myoma.

same frequency and intensity as follows a bilateral oophorectomy.

As a general rule, the younger the patient, the more pronounced the menopausal symptoms. However, these, if severe, may be controlled nicely with amniotin or theelin in oil. One c.c. of either preparation given hypodermatically, once weekly, is usually sufficient to abate the symptoms. As the trouble subsides the injections may be given further apart.

Serial studies have shown that when a dosage of 1200 mg. hours is employed, climacteric symptoms other than the mere checking of the menstrual function in varying degrees of intensity will be produced in 60 percent of patients. In 36 percent the symptoms will be marked. As a rule they persist from a few months to two or three years and then subside. With the smaller dosage of from 300 to 400 mg. hours recommended for young women, in no case in my series has permanent amenorrhoea been induced. Our observations substantiate the experimental work of Matthews and others who have found that the ovaries of young animals are more resistant to and exhibit greater regenerative powers after irradiation than do similar organs in older subjects.

Method of Treatment

Having decided that irradiation is indicated in any given case the usual pre-operative safeguards should be employed. In anemic patients a blood transfusion either before or at the time of irradiation is advisable. Five hundred c.c. is sufficient in the majority of cases.

Technique

Under anesthesia a careful pelvic examination is performed. The size of the uterus is estimated and the depth of the endometrial cavity measured with a sound and recorded for future reference. A thorough curettage is performed and the curettings preserved for a histologic examination. The radium properly screened is inserted to the fundus of the uterus. By proper screening we mean a filter equal to at least one millimeter of platinum. Personally I use one millimeter of platinum, ½ millimeter of brass, and ¼ millimeter of aluminum. The radium, covered with one millimeter of platinum is placed inside of a metal intrauterine applicator eight cm. long and composed of ½ millimeter of brass for primary filtration, covered with ¼ millimeter of aluminum for secondary filtration. This tube can be disjointed in the middle by unscrewing, and the distal half is placed at an angle of about 130 degrees, which allows easy accessibility to the uterine opening. Fifty milligrams of radium are placed in the fundus area and 15 in the region of the cervical canal. Around the lower end of the tube is tied a No. 1 chromic suture and a linen thread. One end of the chromic suture is stitched through the cervix and tied. This insures the maintenance of the radium in the desired position. When the radium is to be removed, the chromic stitch is cut and the tube is then easily withdrawn by the linen. Fifteen hundred to 2,000 milligram hours is my standard dose, and is usually secured by applying 65 mg. of the element for the required number of hours. Except for the withdrawal of the radium the after-treatment is similar to that given to simple curettage cases. As a rule these patients remain in the hospital for five days. Some douches are administered, depending on the amount of vaginal discharge. It is unwise to permit the patient to go home earlier since the surgeon should see the patient through any possible complication arising from his surgical intervention. Our rule is that all irradiation patients return for examination three and six weeks after treatment, and every four to eight weeks thereafter, covering a minimum period of one year. No special after-treatment is required in the average case other than good hygiene, regulation of bowels and an opportunity to recover from the effects of the anemia which has often been present.

Results

Not infrequently, after irradiation, one, occasionally two, rarely three menstrual periods occur prior to the onset of the permanent amenor-
and Norris in which an end result study was pos-
rhoea. Individual patients vary in this respect.

The period of the menstrual cycle in which the

Type of Uterus and Result of Treatment

	Fibrous Fibroid and Fibromatous	Menorrhagia and Metrorrhagia in Young Girls.
Dose	1500 - 2000 mg.hrs.	300 - 500 mg.hrs.
Age	25 - 74 yrs.	15 - 25 yrs.
No.Cases	140	10
Failures	1 (2nd treatment (required	Normal flow (3 mos. to 1 year)
Cases not heard from	10	0
Grand total	130 cases	10

irradiation is performed has a bearing upon this point. If the irradiation is performed shortly before the expected period it is less likely to influence the expected flow. Usually within four to six weeks at most, structural changes induced by the irradiation will have progressed sufficiently to check all bleeding. On this basis Gellhorn recommends irradiation soon after a menstrual period and this is undoubtedly the time of election.

All patients should be warned that the action of the radium is often slow, and they should not be discouraged if amenorrhoea is not produced at once. Among the 476 cases reported by Clark and Norris is which an end result study was possible, 96 percent were cured either by the production of a permanent amenorrhoea, or a temporary amenorrhoea was produced followed by a return to the normal of the amount and periodicity of the menses.

Taussig collected statistics formulated from nearly 1,100 cases of myoma treated by irradiation, showing 95.5 percent of cures. Numerous other statistics could be quoted but we believe the above results demonstrated the average incident of cure in properly treated cases, and that further citation is therefore unnecessary.

Excellent results have also been secured in the treatment of uterine myomata by the X-ray. The disadvantage of the X-ray apart from the fact that the treatment is prolonged, lies in the fact that a curettage must be preformed as a separate procedure to exclude the possibility of overlooking the presence of a fundal carcinoma. If we accept the necessity for a routine diagnostic curettage, it is far easier for the patient, to irradiate at the same sitting rather than prolong the procedure over weeks or months with often no better end results. The incident of fundal carcinoma and myomata is relatively frequent. It is unlikely that the experienced surgeon will not at least suspect the presence of a fundal carcinoma in an individual case. In large groups, however, occasionally such a mistake will be made due to the pre-existing symptoms from the myoma completely masking those of the carcinoma.

In conclusion may I say that we, therefore, believe that a curettage followed by a histologic examination of the curettings by a competent pathologist is an essential feature of every irradiation for hemorrhage of a supposedly benign origin. Neglect of this detail is to court trouble. The amount of irradiation generally applied for benign hemorrhage is from 1,200 to 1,500 mg. hours. In my series, however, I have given an average of from 1,500 to 2,000 mg. hours, with a maximum of 4,000 in one case, which was an unusually large fibroid. I have had but one which required a second treatment because of hemorrhage, and this individual began to flow heavily eleven months after she had received an initial treatment of 2,350 mg. hours. She was accordingly given 2,000 mg. hours more, and has had no further trouble to date, it being one year since the last treatment. The heavier dosage which I have given undoubtedly accounts for the few recurrences, which are less than are in general found in the literature. A combination of radium and X-ray irradiation may be well utilized in the treatment of large tumors in which removal is contraindicated. The contraindications to X-ray therapy are the same as for irradiation by radium.

Regarding hemorrhages of benign origin other than those caused by myomata, we may say that many pelvic and a few general conditions may result in pathologic uterine hemorrhage. It is unnecessary to enumerate these various conditions again. In the so-called myopathic hemorrhage irradiation is practically specific. These hemorrhages are most prone to occur in women over 40 years of age, and are, therefore, especially suitable for irradiation.

There is little need for comparison between surgery and irradiation in the treatment of uterine myomata. The indications for surgery are well defined. Myomectomy and hysteromyomectomy are among the most satisfactory operations which the surgeon is called upon to perform both from the immediate and end-result standpoint. However, the advantage of irradiation in certain types of cases are well proven, and the surgeon who submits these patients to operation is incurring an unwarranted risk, and will in the long run secure less successful results. Surgery is associated with an operative mortality of from two to seven percent, even in the most experienced and skillful hands, a clear salvage of from 1.82 to 6.82 percent. Markedly anemic patients are notoriously poor surgical risks and are the very type in which radium secures its most brilliant results. It is in such cases, as Kelly has phrased it, that radium is the modern medical miracle.

Contact Dermatitis—A Summary of Various Causes*

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CONTACT dermatitis is the term commonly used to designate the reactions of the superficial layers of skin which possesses an acquired hypersensitiveness to various external irritants. In America, eruptions belonging in this category have been called dermatitis venenata, occupational dermatitis, eczematous dermatitis, etc., while in Europe the word eczema is generally used as a broad designation for the group.

Contact dermatitis seems to be distinct from the familial dermatosis known as atopic dermatitis, hay fever-eczema, or neurodermatitis disseminatus. The characteristics of the two conditions and the points of differentiation have been so well covered in publications by Coca;[1 2 3] Sulzberger, Spain, Sammis and Shahon,[4] and others[5 6 7] during the past few years that it is unnecessary to repeat them here.

Contact dermatitis is important in a multitude of industries. A surprisingly large number of occupational diseases involve the skin and of these dermatoses many are cases of contact dermatitis. Wise and Sulzberger[9] brought out the fact that the number of industries which could be affected was surpassed only by the number of causative agents involved.

Dermatitis may occur within a short time or after longer periods (even years) of contact with an offending agent. Fungus infections, through interrupting the continuity and lowering the natural resistance of the skin, are thought to be an important contributing factor in many cases. Burns, cuts, scratches, abrasions, and friction likewise may permit the entry of an excitant which might otherwise cause no trouble if placed in contact with the unbroken epidermis. Experimental work has shown that the contact type of hypersensitiveness is in general favored through scarifying or traumatizing the skin.

Heat and moisture, which are more or less constantly present in many occupations, may also predispose to contact dermatitis. This fact is exemplified by the frequency of the condition in dishwashers, bakers, kitchen workers, housewives, etc. Any deviation from the normal condition of the integument whether it be maceration, or excessive dryness with resulting fissures, favors the development of contact dermatitis by rendering the protection of the skin inadequate.

Why a person who has been in contact with a particular substance for a long time should relatively suddenly develop hypersensitiveness cannot at present be satisfactorily explained. As Sulzberger[5] stated, there are three developmental steps in the chronology of contact dermatitis:

1. Period of refractoriness to sensitization, which may vary from zero to many years.
2. Period of incubation of sensitivity, which Sulzberger, from studies in butesin sensitivity, believes is usually from nine to 14 days.
3. Period of reaction time, or that period which elapses between contact with the excitant and the appearance of the eruption in the hypersensitive individual. This may also vary from case to case but is usually from 18 to 72 hours.

Broadly speaking, in eruptions occuring about the face and neck one must first consider as causative agents articles of clothing and cosmetics of all types (especially in women) and plants. Seasonal eruptions occuring yearly at definite times immediately suggest pollens as the etiologic factor. Dermatitis on the hands and in other areas requires most careful questioning in the search for the cause. As Anderson and Brunsting[6] mentioned, a disabling dermatitis in a dentist may be due to procaine or the hydroquinone X-ray developing fluid. Dermatitis in a florist may be due to any of several plants or the insecticide which he uses. Each case requires strict individualization and but few set rules can be applied.

In contrast to the excitants in atopic dermatitis which are proteins (foods and inhalants), the causative agents in contact dermatitis are extremely varied in nature, and include a multitude of non-protein substances. In considering these, it must be remembered that the skin may react to a great number of so-called primary irritants, such as strong caustics, acids, alkalies, escharotics and rubifacients, without the existence of a state of hypersensitiveness. Certain strong cleaning powders and fluids, soaps, grease removers, etc., are included among the primary irritants.

In some cases the nature of the excitant is plainly evident while in others it is extremely obscure. Anderson and Brunsting[6] mentioned the fact that a certain Sherlock Holmes attitude is necessary in order to be successful in analyzing these cases. Sensitizations may be single or multiple and may be grouped to involve related chemical compounds or species of plants. Generally speaking, sensitization to one excitant has a tendency to favor the development of polyvalent hypersensitiveness. In patients who are thought to have occupational contact dermatitis, the possibility that the irritant is present in the surroundings away from, rather than at work must not be forgotten.

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An exhaustive complete list of all of the substances which have been reported as causing dermatitis is practically impossible and the number is steadily increasing. In the following discussion an attempt is made to broadly group these excitants as well as possible and especially to include the causative agents which have been reported in the past few years. There is by necessity considerable overlapping. Weber,[9] in 1930, compiled an extensive list of cutaneous irritants, which may be referred to for specific substances. In the dermatology clinics at the University of Minnesota and Minneapolis General Hospitals, numerous and varied causes of contact dermatitis have been found. For brevity, personal experiences will be omitted in the following discussion.

A. Plants:

The best known example of contact dermatitis is that due to poison ivy (rhus toxicodendron), the active principle of which is an oleoresin. In 1922, Spain[10] showed by patch testing 80 individuals with alcohol and chloroform extracts of the leaves, that 65 per cent of persons eight years of age or over were susceptible to poison ivy. In contrast, no positive reactions were obtained by the same method in 18 infants between five and 18 months of age. About the same time Coca[11] obtained similar results which substantiated the findings of Spain. By patch testing 12 adults over 20 years of age, only one remained unaffected, while one of 12 children five years of age or under was found to be susceptible.

In 1928, Straus[12] tested adults with the alcoholic extract of poison ivy in lanolin, and found that 75.6 per cent reacted positively, while 119 newborns showed no positive reactions. He believed that the reason for this was lack of contact with poison ivy rather than lack of ability to become sensitized. He substantiated his views by showing that 72.9 per cent of 48 infants which had been among the 119 originally tested, gave positive reactions on repeated patch testing after an interval of two to four weeks.

Treatment by intramuscular injections of ivy oil may be given prophylactically in highly sensitive patients or during the actual attacks. In some instances, it seems that susceptibility to the plant may be lessened or the duration of an individual attack shortened.

In the rhus genus of plants are the following species, any of which may cause dermatitis: Rhus toxicodendron (poisin ivy), rhus venenata (poison sumac), rhus diversaloba (poison oak), rhus vernicifera (Oriental lacquer plant).

The primrose may cause acute or chronic dermatitis with about the same ease as does poison ivy. Low[13] was able to sensitize himself and two of eight others by repeated contact, who were at first not susceptible to the plant. Bloch[14 15] was able to do the same thing in 100 per cent of attempts. These experiments with primrose and ivy sensitization show that in the specific instances concerned at least, cutaneous sensitization can be induced at will, which is in direct contrast to the atopic form of hypersensitiveness.

Simpson[16] and Keston and Lazlo[17] have within the past few years also discussed and reported cases of primrose dermatitis.

Pollen Dermatitis—Contact dermatitis due to pollens is characterized by definite seasonal recurrences during the particular time of pollination of the plant in question, involvement of the exposed surfaces of the body (face, neck, hands, arms and legs), and as a rule complete absence of other allergic disorders such as hay fever and asthma. Until the work of Brown, Milford and Coca[18] it was generally believed that the hay fever producing portion of the pollen also caused contact dermatitis. Among the reports in recent years Sulzberger and Wise[19] described a case of ragweed dermatitis which they believed was caused by the ragweed pollen atopen. Even at that time, however, they reported that scratch tests were negative while patch tests with the same material were positive. Brown, Milford and Coca discovered then that a definite positive contact reaction could be obtained in patients with ragweed contact dermatitis using the oily residue of the pollen extracted with the usual fat solvents. In the same patients patch tests with pollen from which the oil had been removed were completely negative, proving that the cases of ragweed pollen contact dermatitis were not caused by the atopic water soluble excitant in the pollen. Patch, and especially scratch tests thus are negative when the pure form of the water soluble atopic excitant portion of the pollen is used.

Gay and Ketron[20] in 1932, and Pascher and Sulzberger[21] in 1933, verified the earlier findings of Brown, Milford and Coca. In the patient of Gay and Ketron a dermatitis of the exposed portions of the body had been present for 13 years, beginning always about August 15th. There was no history of atopic disease and intradermal tests for pollens were negative. Patch tests with raw pollen and pollen oil were positive. Pascher and Sulzberger also believed that in their two cases the causative factor was the pollen oil.

Their observations as to pollen oil apply in general to all plants which cause dermatitis. There are, however, occasional exceptions such as those which Pascher and Sulzberger mentioned: Angelica silvestris, in which the active principle is a lactone, and cinchona bark in which it is the water soluble alkaloid quinine.

In the case of pollen dermatitis the various individual members of the same general group will cause positive patch tests as a rule. For example, giant as well as westward ragweed and burweed marsh elder, which also belongs to the ragweed group, usually all cause an eczematous response in the susceptible patient. Anderson and Brunsting[6] noted this in one of their cases of ragweed dermatitis. This is not invariably true, however. Huber,[22] and Huber and Harsh[23] reported three cases of dermatitis recurring in the late summer months in which patch tests were positive only to the burweed marsh elder. Ramirez and Eller[24] noted a case of summer dermatitis during June and July accompanied by hay fever from August until frost in which patch tests were positive only to timothy, while scratch tests were positive to ragweed, also illustrating the fact that contact dermatitis and atopic manifestations may occur simultaneously but separately in the same patient. In the above patient scratch tests of timothy, and patch tests of ragweed were completely negative, bearing out the fact that the excitants of the contact and atopic types of pollen hypersensitiveness are distinct from one another.

The same general statements made concerning the ragweed family apply to other plant groups. Some favorable results in the treatment of this condition have been reported, such as those of Ramirez and Eller,[24] and Pascher and Sulzberger,[21] especially in the case of ivy, ragweed and chrysanthemum, using the concentrated plant oil diluted in almond oil and given intramuscularly in gradually ascending dosage. The method is worthy of trial for shortening the duration and severity of individual attacks and for attempts at pre-seasonal desensitization in instances of plants pollinating or abounding during definite periods such as ragweed, sage, thistle, pigweed, timothy, etc. From their study, Ellis and Rosendahl[25, 26] found the following plant groups most important in Minnesota from the standpoint of pollens. The table is of value in attempting to determine the cause of seasonal pollen dermatitis in this vicinity:

Group	*Time of Pollination*
Ragweed	July 28-Sept. 20
Sage-wormwood	July 6-Oct. 1
Blue grass	May 22-July 30
Millet	June 5-Sept. 20
Timothy	May 20-Sept. 1
Grama grass	July 1-Sept. 15
Rye	June 1-Aug. 20
Pigweed	June 15-Sept. 10
Sweet vernal grass	May 8-July 20
Russian thistle	June 15-Aug. 30

Only a few other reports will be mentioned here although practically any plant can cause dermatitis in a susceptible person. For an extensive list of plants reference may be made to the article by Weber,[9] and for a discussion of tropical plants to the excellent work of Pardo-Castello.[27]

Overton,[28] and Welker and Rappaport[29] reported cases of dermatitis of the hands due to contact with tulip bulbs. The latter case occurred in a worker in the plant and bulb section of a department store and was seasonal, beginning in October and clearing up in January, since the store stocked the bulbs during that particular period. Patch tests of aqueous and ether extracts of tulip bulbs were positive and passive transfers using the Prausnitz-Kustner method were negative.

Geranium and chrysanthemum dermatitis is relatively common, especially among florists. J. W. Anderson[30] reported an example of geranium dermatitis due to a house plant. Patch tests, using the leaves, were positive. C. R. Anderson and Brunsting,[6] and Pilot[31] have recently observed examples of chrysanthemum dermatitis. The former occurred in a female who worked with flowers a great deal. Patch tests to various plants were negative except in the case of chrysanthemums which caused positive reactions both with the flower and the leaf. It is usually true that the active principle of a dermatitis producing plant is contained in all portions of the plant. Anderson and Brunsting believe that the chrysanthemum, gaillardia, cineraria, snapdragon, poinsetta, geranium and pyrethrum are among the most important plants from the standpoint of contact dermatitis.

Pilot's patient was a florist who had a dermatitis of the face, neck and wrists for 10 years during the fall and early winter. Patch tests to the plant oil of chrysanthemum were strongly positive in 48 hours while the aqueous extract caused no reaction.

O'Donovan[32] reported two interesting cases of dermatitis due to hops in workers in the English hop fields.

Schur[33] observed an odd case which was shown to be caused by the osage or wild orange.

B. Cosmetics and Toilet Articles:

This group includes a multitude of substances such as depilatories, deodorants, mouth washes, toothpastes, and powders, face and talcum powders, creams, rouges, eye shadow, lipstick, mascara, hair and skin bleaches, hair dyes, toilet waters and perfumes. As in the plant group any individual compound may be etiologically important in the hypersensitive person and yet be innocuous to many others. Wise and Sulzberger[8] brought out the fact that in eruptions about the face and neck, the patch test should be applied as near as possible to the area of actual dermatitis, since localized areas of hypersensitiveness are not uncommon.

Cole,[34] in 1924 and later in 1927,[35] made extensive investigations of injuries caused by cosmetics, both in his own experience and from reports of many other dermatologists throughout the country. He found such dermatoses to be surprisingly frequent.

Various metals and other substances enter into the composition of cosmetics. Lead is found as acetate in hair dyes, and as carbonate in face enamels and creams to give a soft "feel." Mercury also is an ingredient in certain dyes but is more common in face creams and skin bleaches as ammoniated mercury. Mercuric chloride enters into the composition of freckle lotions and creams. Calomel is found in some toilet creams. Calcium and barium salts are contained in depilatories. Most important of all as causes of dermatitis are the paraphenylendiamin compounds which are used frequently in hair dyes as they stain numerous colors, are quick in action, easily applied, and penetrate deeply. Many other substances are occasionally found in hair dyes such as silver compounds and pyrogallic acid. Resorcin, salicylic acid, menthol, quinine and wood alcohol often go to make up hair and skin "tonics," all and any of which may cause violent dermatitis.

Sulzberger and Kerr[5] reported two cases of diffuse, red, scaly eruptions on the face and neck due to powder, as well as dermatitis of the hands and wrist due to a supposedly soothing cream. Patch tests were positive for the offending substance in each case.

Engmann and Wander[36] reported the case of an actress who was hypersensitive to mascara, which caused a dermatitis of the eyelids each time she used the cosmetic. Patch tests applied on the chest, however, were negative. In this type of case, tests may succeed when applied just above the eyes. The same workers also related similar cases due to cold cream and powder.

Lane and Straus[37] observed a patient who suffered with a dermatitis of the neck following the application of toilet water. The active ingredient was found to be quinine. Burgess and Usher[38] reported 10 similar cases which were found to be due to quinine in shaving lotion. Ford[39] noted a patient who at first developed an eruption on the face following the use of a hair tonic containing quinine. About six months later he returned with an edematous, vesicular, dermatitis of the penis, scrotum, cheeks, ears and neck. The night previously his wife had used a vaginal contraceptive suppository and he awoke the following morning with severe itching of the genitalia. A day later the face became affected. Investigation showed that the contraceptive contained quinine bisulphate. Enough of the drug was apparently absorbed and hematogenously carried to the areas of the previous involvement to cause an exacerbation of the dermatitis in those areas.

Ramirez and Eller[24] reported cases of dermatitis due to egg white (contained in shampoo), flaxseed (hair tonic), alcohol (external use), orris root (powder), icthyol (in shaving cream), and human hair (wig).

Harner,[40] Bourbon,[41] and Jamieson[42] reported cases of severe dermatitis about the eyes accompanied by conjunctivitis, due to eyelash dye. Jamieson's patient suffered loss of vision due to corneal opacity.

C. Clothing Material:

Included in this group are the various textiles such as cotton, wool, silk and rayon; as well as leather, furs and feathers, making it a rather heterogenous but convenient classification.

Case 4 in Lord's[43] report was apparently one of contact dermatitis due to wool, even though percutaneous as well as patch tests were positive to sheep wool. The patient, who was 42 years of age, developed an eruption six years previously on the hands, wrists, axillae and antecubital spaces, which was aggravated by contact with woolen garments. Following the holding of a wool covered electrode during the removal of hairs by electrolysis she developed an acute dermatitis on the palm a day later. Ramirez and Eller,[24] and Sulzberger and Morse[44] also mentioned cases of contact dermatitis due to wool and lanolin (wool fat).

Ramirez and Eller[24] observed dermatitis due to linen.

Anderson and Brunsting[6] related the case of a male, aged 36, who developed an acute vesicular dermatitis following the wearing of a new pair of rayon hose. Wrapping one sock around the forearm duplicated the eruption.

Klauder[70] described a patient who was unable to wear black silk whereas white or any other color of silk caused no eruption. Cotton or any other material, even though dyed black, caused no difficulty. The dermatitis first appeared when the patient was six years of age and the degree of hypersensitiveness was just as great at the time of the report when the patient was 61 years old.

Lewis[45] observed two patients with dermatitis affecting the feet and ankles, one who was hypersensitive to "bleached kip" (which is made from cowhide and used as a lining in shoes), and another to leather proper. Lewis brought out the fact that tanning is a complicated process which utilizes many chemicals such as tannic acid, chromium sulphate, coal tar dyes, and wood extracts, all of which may cause dermatitis. Anderson and Ayres[46] observed a similar case which had been previously diagnosed eczema and fungus infection. It was not definitely determined whether the dye or the leather was at fault. Parkhurst[47] treated a male, aged 50, who was hypersensitive to undyed deerskin leather and developed an acute dermatitis of the hands and wrists upon wearing deerskin gloves. Sulzberger and Kerr[5] related a case of dermatitis due to leather in hat bands. The patient had been treated for 17 years for seborrhea.

Cole[35] mentioned the frequency of furs and fur dyes as etiologic factors in contact dermatitis. Ramirez[24] and Eller noted similar cases.

Simon and Rackemann[48] told of a patient who suffered repeated attacks of contact dermatitis on different parts of the body, due to various articles of clothing. The overcoat collar, garters, socks, shoes, suit linings, his wife's dresses, furniture upholstery and other components of his attire were incriminated at one time or another.

D. Soaps and Washing Materials:

Members of this group of substances, which includes a multitude of solid, liquid and flake soaps, washing compounds, bleaches, scouring powders, water softeners and starch frequently cause acute, subacute, or chronic eruptions especially on the hands and wrists. It should be remembered that many such compounds are primary irritants and cause dermatitis in which no phenomena of hypersensitiveness are involved. To be of any diagnostic significance patch tests must be applied in weak concentration (½ to 1 per cent).

E. Foods:

In 1930, Feit[49] presented a patient to the New York Academy of Medicine, who was hypersensitive to cake dough. The man was a baker and developed dermatitis of the hands whenever he handled dough which contained sugar such as that from which cake and cookies are made. The dough used in making bread and rolls caused no trouble.

Tulipan[50] also treated a baker who was intolerant to cinnamon. In his work he came in contact with flour, baking powder, cream of tartar and cinnamon. Only the latter gave a positive patch test.

Van Vono, Stuycken, and Bonneire[51] believed that occupational dermatitis in bakers was frequently due to ammonium persulphate, a substance used by millers to improve the quality of the flour.

Fanburg and Kaufman[52] observed a worker in a beverage factory who developed an eruption of the hands and forearms about a week following the peeling of lemons. Contact tests were negative for lemon juice but positive in 24 hours for lemon peel.

Kesten and Lyons[53] reported three cases of contact dermatitis due to orange peel, and stated that it was frequent in pickers of the fruit. All of their patients encountered no difficulty on drinking orange juice. In one patient, a fruit and vegetable merchant, desensitization was accomplished by means of subcutaneous injections of the ether and alcohol extract of orange peel, beginning with a 1:10 dilution of the extract which would just give a positive patch test. These were continued four months until the dosage at the end of the treatment had been increased to one c.c. of a dilution 1,000 times the concentration of the initial dose. Patch tests with one per cent oil of orange, and orange peel were then negative, and at the time of the report the eruption had not recurred in seven months.

Rinkel and Balyeat[54] reported the case of a salad maker, 43 years old, who had suffered from an acutely exacerbating dermatitis of the hands, arms, neck and face for five years, accompanied by pruritis and occasional urticaria. There were no other allergic disorders either in the patient or her family. Scratch tests to lettuce as well as to danders and pollens were negative. She believed, however, that lettuce was a contributory factor and though she continued making salads she cleared up within three weeks when other workers handled the lettuce. She remained free from trouble if she neither ate nor handled lettuce. Even after eating lettuce she would develop the typical contact type of dermatitis. Patch tests with lettuce were strongly positive and surprisingly a positive reaction was later obtained in intradermal testing with lettuce extract. This in all probability was the contact rather than the atopic type of hypersensitiveness, and upon ingestion of the excitant enough reached the contact layers of the epidermis to produce the eruption, as is the case in the eczematous type of drug eruptions. It was not stated how much time was required before the intradermal test became positive. As the authors stated, it is difficult to evaluate this finding.

Ramirez[52] and Eller experienced contact dermatitis due to grapes. Asparagus, celery, tomatoes, and many other fruits, vegetables or foods may occasionally be responsible for the production of this type of eruption.

F. Medications, Drugs, Antiseptics, Etc.:

Innumerable chemical compounds used either singly or in combinations in various types of medication may cause contact dermatitis of any part of the body.

Anesthetics—One of the best known examples is the eruption frequently produced by procaine in dentists, nurses and physicians. Klauder,[55] Sulzberger[7] and Wise, Kesten and Lazlo,[17] Lane,[56] Ramirez and Eller,[24] James,[57] and others have reported such cases. The eruption is almost always on the hands and subacute or chronic in its course. Patch tests with one per cent procaine are usually positive.

Keston and Lazlo[17] reported a case of hypersensitiveness to noval, an anesthetic related to novocaine.

Greenwood and Quest[58] observed a patient with an eruption due to butyn, and emphasized the frequency of dermatitis due to related substances such as stovain, apothesin and procaine.

Sulzberger and Wise,[7] and Fowlkes[59] noted cases of sensitization to nupercaine, prepared in ointment form for pruritic conditions, especially of the mucosae.

Dermatitis from butesin picrate, often used in the treatment of acute burns, is relatively frequent. Pusey and Rattner,[60] Jackson,[61] and Fox[62] reported such cases. Sulzberger and Wise[63] noted that butesin not commonly causes a follicular eruption accompanied by edema, while picric acid gives rise to erythema and vesiculation.

Antiseptics—Keston and Lazlo[17] observed a nurse who complained of a dermatitis of the hands following the use of potassium mercuric iodide as an antiseptic in a contagion ward. Desensitization in this case was successful by first immersing the hands in a one to 100,000 dilution of the drug for one minute and gradually increasing the concentration and time daily until she could tolerate a one to 5,000 dilution for five minutes. She was then able to use scrub brushes dipped in the antiseptic without further difficulty.

Pascher and Silverberg[64] treated five patients who were shown by the patch test to be hypersensitive to mercurochrome and associated mercurical drugs such as metaphen, ammoniated mercury, mercury oxide and mercuric chloride.

Cummer[65] reported two cases of sensitization to hexylresorcinol; one in which the solution (S. T. 37) was used as an antiseptic, and one in which it was contained in toothpaste. Mitchell[66] also experienced a case of resorcin sensitization. The substance was contained in suppositories and caused an acute dermatitis in the anal region.

McNair and Neff[67] reported dermatitis due to Dichloramin-M, an antiseptic similar to Dichloramin-T. They stated that both substances could cause eruptions and that prevention was possible in the case of Dichloramin-M and probably in the case of Dichloramin-T by the washing of the exposed skin with reducing agents such as aqeous potassium iodide or sodium thiosulphate.

Sulzberger and Kerr[5] reported a case of dermatitis of the hands and arms which was shown to be caused by a new proprietary ointment (mazon) which the patient had contacted in washing her daughter's clothes. The latter was using the preparation to treat a ringworm infection. Patch tests on the mother with mazon ointment were strongly positive. The same authors also observed a case of hypersensitiveness to calmitol, another proprietary product.

In 1928, Persky[68] presented a patient to the Brooklyn Dermatological Society who had a dermatitis of the trunk due to the plaster contained in a cast which was applied for tuberculosis of the spine.

Halloran[69] emphasized the wide range of possibilities of arsenic as a causative agent of contact dermatitis (as well as dermatitis medicamentosa).

Scheer,[70] and Ayres and Anderson[71] reported cases of contact dermatitis due to ephedrine.

These eruptions are usually localized to the face, since the drug is usually used in nasal sprays.

Wolfe and McLeod[72] observed a patient with a severe dermatitis about the eyes due to atropine. The eruption was at first thought to be erysipelas. Patch tests were positive to atropine. Cummer[73] noted a dermatitis of the eyelids which was caused by dionin (ethylmorphine hydrochloride), a drug commonly used as a lymphogogue in eye conditions. In this case, hypersensitiveness developed after 11 years' usage of the drug. Exacerbations of the eruption were definitely associated with the use of dionin, though patch tests were negative.

Heller[74] observed an eruption in which patch tests to opium were positive, due to the local application of lead and opium wash. Opium taken by mouth caused an exacerbation of the dermatitis.

Nelson[75] reported a case of dermatitis of the hands which was proved by patch tests to be due to oil of cade. The tests were positive to all concentrations of the drug which were stronger than 0.5 per cent. There was rapid involution upon discontinuing the drug.

Cummer[76] treated a patient who had used an ointment for a burn containing, among other medicants, Balsam of Peru. An acute dermatitis resulted, and of all the ingredients only Balsam of Peru reacted positively upon patch testing.

G. Insecticides and Parasiticides:

As a general rule these compounds contain as an active ingredient either pyrethrum or sodium fluoride. In instances where hypersensitiveness exists to only one type of substance a substitution may be made and thus avoid dermatitis. Keston and Lazlo[17] cited the case of a zoologist who had a dermatitis of the face, neck and arms which was found by patch testing to be caused by pyrethrum contained in "Black Flag" and "J. O." insecticides. He changed to a sodium fluroide product and was free from trouble henceforth. Sulzberger and Weinberg[77] reported a similar case of dermatitis involving the arms, legs, neck and body in a housekeeper due to Black Flag (pyrethrum) insect powder which was being distributed periodically in the patient's work room. McCord, Kilker and Minster[78] stated that pyrethrum dermatitis was common in makers of insect powder.

H. Woods:

Senear[79] recently discussed in detail the question of dermatitis due to woods. He believes that such cases are relatively common and that woods of temperate climates give rise to reactions more often than is generally supposed. Dermatitis may develop at any time following contact, but in general appears within a few days to a few weeks. The toxic agents are usually nonsaturated resinous acids or alkaloids, although other chemicals may be responsible in some cases. Senear reported a case of dermatitis which he treated which was due to contact with yew wood, used in making high grade archery bows.

Among the Oriental and other foreign woods which Senear found that had been reported as causes for eruptions were: Coco-bolo, satinwood, teak, lemon wood, acacia, Borneo rosewood, olive wood, cocos wood, sobica and partridge wood. In certain instances actual contact is not necessary, enough of the excitant being present in the air to cause trouble. Among the common woods which Senear mentioned were: Oak, beech, acacia, chestnut, poplar and elm.

Senear also reviewed "forest essence" dermatitis or woodcutter's eczema, which has been described in France and Italy, and which is in reality contact dermatitis.

Wood preserving materials such as coal tar distillates, water gas tar, and zinc chloride may cause dermatitis as well as the woods themselves.

I. Metals:

Dermatitis due to nickel has been known for many years to exist quite commonly among nickel-platers and workers who handle the metal or its salts in industrial plants. Goldman[80] recently reviewed the subject of dermatitis due to nickel and reported two cases in nickel workers, both of whom developed the eruption in the first few days of contact. The author also discussed the possibility of nickel coins and nickel-plated objects as potential eczematogenic agents and suggested that these articles should be considered in studying dermatitis of the hands of hitherto unknown etiology. In Goldman's first case, patch tests were done with one per cent nickel sulphate, one per cent nickel chloride and pure nickel (metal). All were strongly positive except the latter. In the second case nickel sulphate, nickel ammonium sulphate, nickel propionic acid and nickel lactate were used. All caused positive responses in the test areas, showing that the hypersensitiveness of the skin was to the nickel ion in combination with either organic or inorganic acids. Goldman, through further testing, found that the specificity was so strict that the skin did not react even to the most closely related chemical substance, cobalt.

Lain,[81] Fox,[82] McAlester and McAlester,[83] and others[7] have reported cases of dermatitis due probably to the nickel contained in alloys used in spectacle frames and jewelry. So-called white gold is an alloy of gold, copper and nickel and may cause eruptions over the bridge of the nose, sides of the face, and behind the ear due to contact with spectacle frames, or on the wrists and fingers due to wearing a wristwatch or ring. In these cases substitutions as to the type of spectacle frame or jewelry should be made.

Bronze contains copper, aluminium, lead, tin, arsenic and iron, and bronze powders are ordinarily affixed to surfaces that are being printed by means of glues, sizes or bronzing liquids. Either the bronzing powders or the fixatives may cause dermatitis.

J. *Dyes (All Types):*

It has been mentioned previously that the paraphenylendiamine dyes are frequent excitants in contact dermatitis. Sulzberger and Kerr[5] reported a case of dermatitis of the feet due to a black shoe dye of this type. Brown shoes and certain black ones caused no difficulty. Patch tests with two per cent paraphenylendiamine in vaseline were definitely positive.

Orthodichlorabenzene, methyl alcohol and aniline black may also be contained in certain shoe dyes and potential excitants of contact dermatitis.

The reports of Kesten and Lazlo,[17] Ramirez and Eller,[24] and Cole[35] emphasized the frequency of dermatoses due to paraphenalyendiamin and fur dyes.

Rowell[84] reported a rather unusual case of dermatitis produced by a red dye in colored paper. A child, in an attempt to play "grown up" had used the paper as rouge to redden her cheeks with the resulting acute eruption. The exact nature of the dye was not determined.

Billington[85] experienced and reported acute dermatitis in himself caused by the dye in a velour upholstered chair, which was Bindschedler's green, one of the paraphenylendiamin group.

Cummer[86] observed a patient who suffered a dermatitis of the buttocks due to contact with a red-stained toilet seat.

Oliver reported 15 interesting cases in which eruptions of the face, neck and eyelids appeared every Monday or Tuesday after the patients had read the rotagravure section of the Sunday newspaper. After appropriate patch testing, Oliver found that the excitant was para-red dye contained in the rotogravure ink.

K. *Oils, Shellac, Lacquer, Varnish, Paint, Glue, Solvents, Etc.*

Pusey[88] and later Williams[89] reported cases of dermatitis due to a type of lacquer, which is made from rhus vernicifera, the Oriental lacquer plant. Pusey's case occurred in a dealer of cheap lacquered bracelets and was successfully treated by means of rhus toxicodendron (ivy) extract, both plants being in the same genus. Williams mentioned the frequency of lacquer dermatitis in Oriental countries and the occasional production of eruptions by mah-jong boxes and tiles.

Voukon[107] observed dermatitis due to linseed oil.

Sulzberger and Wise[7] mentioned kerosene and reducing fluids and inks as the causes of dermatitis in printers.

Ramirez and Eller[24] listed glue as a cause of contact dermatitis. One such case occurred in a worker in furniture and another in a violin maker. The same authors found rosin to be the excitant in another violin maker. Dermatitis of the hands due to the varnish on an automobile steering wheel was also observed.

Turpentine is a relatively common excitant in contact dermatitis and is frequently found in paints and floor-oiling preparations. Bloch[14] used turpentine as one of his standard test substances in contact dermatitis. McCord[90] discussed dermatitis due to wood turpentine and reported frequent out-breaks in workers with the substance. Turner[91], in reviewing the causes of dermatitis among painters in an industrial plant, stated that solvents such as turpentine, paint thinner, and naphtha were the most frequent.

L. *Rubber Goods*

Obermayer[92] reported an interesting case of a physician who was unable to wear rubber gloves due to the development of acute dermatitis of the hands. He later suffered an eruption on the genitalia which was ascribed to a rubber condom. Obermayer very skillfully determined that sulphur monochloride which was used in the process of cold cure vulcanization, was the actual excitant rather than the rubber itself. The similarity of this substance to mustard gas led to the idea of rendering it inert by the use of akali. The patient was then able to wear gloves treated with 4 per cent sodium hydroxide without further difficulty.

Niles[93] observed a patient who presented a weeping eczematous patch due to a rubber bunion protector on the inner surface of each great toe. The manufacturers stated that the article was 90 per cent pure virgin rubber and 10 per cent reclaimed rubber and that sulphur was used as a vulcanizing agent. Rubber in the patient's corsets and garters, and rubber gloves had never caused trouble. It is possible that the actual excitant in this case was the same as that in Obermayer's.

Fox[94] reported an odd case of dermatitic of the eyelids due to the rubber portion of an eyelash curler. It was at first thought to be due to cosmetics, but continued observation proved the source of irritation, which was verified by the patch test.

M. Polishes (Shoe, Furniture, Metal, Etc.)

Substances in this group should be thought of as occasional excitants of contact dermatitis.

N. Miscellaneous Substances

This group contains a number of compounds which are not closely related and some which cause difficulty in several industries.

Many attempts, with varying degrees of success, have been made to sensitize the skin of animals and humans to chemicals of known formula. Silverberg's[95] work with mesotan, a drug introduced in 1902 for the percutaneous treatment of diseases which responded to salicylates, was reported in 1930. It had been noted that sensitization of the skin to mesotan ($C_6H_4^{OH}$ $COOH^{-O-C_3H}$) was quite frequent and took place usually after repeated rather than the first application. The drug is formed by the action of formaldehyde, methyl alcohol, and hydrochloric acid on sodium salicylate. It is easily split, and even with small amounts of water forms formadehyde and a small amount of salicylic acid.

Silverberg found that none of the 124 patients who had had no previous contact with mesotan, were primarily hypersensitive. Six of 11 patients who were rubbed repeatedly with the drug became generally hypersensitive in 11 to 34 days after the first application. Some reacted thus even to contact with minute amounts. In all but one case the type of hypersensitiveness was monovalent and in none of the cases was there any urticarial element. Passive transfers were uniformly unsuccessful.

Silverberg also cited the work of others who had successfully sensitized human skin to chemical compounds of known formulae, which included salicylate preparations, mustard oil, cignolinbenzol, sodium nirvanol, arsphenamine, neoarsphenamine, and orthoform. She felt that each substance in question must be studied individually and that no broad generalizations concerning skin sensitization to chemicals could be made.

Dermatitis due to chromium compounds is important in blueprint workers, lithographers and photographers. Parkhurst[96] reported such a case in a patient who had worked in blueprints for 6 weeks. Through patch testing the offending salt was found to be potassium bichromate. It was possible to avoid difficulty by washing the hands in a saturated solution of sodium bisulphite and then water. The bisulphite acts as a reducing agent and changes the chromium atom from the hexavalent to the trivalent state in which form it is apparently non-irritating.

McCord, Higginbotham and McGuire [97] also discussed the question of dermatitis due to chromium compounds, and stated that, although their irritating and toxic properties were recognized, they were still used on account of their superiority to substitutes. These investigators were able to experimentally produce dermatitis in 20 to 25 lithographers by the cutaneous application of gauze moistened with solutions of chromic acid and potassium and ammonium bichromate. Smith[98] also mentioned the frequency of dermatitis among chromium workers.

In photographers the skin comes in contact with numerous chemical compounds contained in developers, among which are potassium bromide, sodium sulphite, amidol, metol, etc. "Amidol," used in developer, is the trade name for diamidophenol and is thought to be less irritating than "metol" (mono methyl-p-amido-m-cresol sulphate). Patients who are susceptible to either metol or amidol may shift to the other and usually escape dermatitis. Hypersensitiveness to metol however, predisposes markedly to polyvalent sensitization which may include amidol.

A striking example of contact dermatitis is so called "match box dermatitis," which was discussed by O. Foerster[99] in 1923. This type of dermatitis first appeared about 1914 when phosphorus sesquisulphid came into the match industry in the use of the "strike anywhere" match. In this condition sharply circumscribed areas of dermatitis appear under the pockets in clothing where matches are kept. The thigh is a common location. Removal of the cause usually effects a cure rapidly, though occasionally it is necessary to change the lining of the pocket.

Such compounds as bakelite, laconite, etc., occasionally cause dermatitis. Eller[100] reported a case due to radio ear phones and stated that they were constructed from either a phenolic compound similar to bakelite, or laconite which contains shellac, rosin, marble dust, carbon, fossil gum and mica filler. Dermatitis may result from either type of compound. I. C. Sutton[101] observed a patient who had an acute eruption caused by black hornrim spectacle frames made of Zylonite, similar to bakelite. He also mentioned cases of dermatitis about the mouth from cigar holders and of the ear from ear phones of similar composition.

Beinhauer[102] observed a violinist who had contact dermatitis due to rosin which he used on the bow. Patch tests were positive to dark rosin only.

Crutchfield[103] reported a case of dermatitis due to the Portuguese Man-of-War. The tentacles of the animal, which is a coelenterate, contain an irritant which may cause an eruption in certain individuals.

Johnson[104] noted that ethyl gasoline might cause contact dermatitis. In a patient which he treated, patch tests with ethyl gasoline were positive in dilution of 1 to 500 while tests with ordinary gasoline were negative.

Weber[105] recorded the observation that the organism brucella melitensis abortus, which causes abortion in cattle, may bring about a cutaneous eruption not due to direct infection but to a mechanism of hypersensitiveness. He noted cases in veterinarians.

In cement workers, lime, sulphur, trioxide and calcium hydrate are capable of provoking cutaneous reactions.

Hydrolene oil (asphaltic pitch) which is contained in briquettes, occasionally causes dermatitis, especially in coal drivers.

Taylor[106] reported a cutaneous eruption which followed the dressing of rabbits.

As has been mentioned earlier, this discussion does not include a complete list of cutaneous irritants, but gives the most common as well as some of the rarer excitants. New ones are being reported frequently and it is not amiss to state that almost anything is capable of producing contact dermatitis in the hypersensitive individual.

The Patch Test:

The scratch or intradermal tests which are used in atopic dermatitis are as a rule negative in contact dermatitis. The patch test, which is of great value in determining the cause of contact dermatitis has been described and discussed so many times recently that the method used need not be repeated here.

A positive patch test does not always indicate that the responsible substance has been found, nor does a negative test rule out the possibility that the suspected irritant is the wrong one. Polyvalent sensitizations are frequent and the first often predisposes to hypersensitiveness to many substances. Falsely positive tests may result from too high a concentration of the irritant. Testing materials should in general be used in strengths of 1 to 10 per cent of the suspected irritant.

It is not difficult to understand why negative tests occur when one considers that it is almost always impossible to duplicate the exact conditions under which the irritant acts upon the skin naturally. As has been previously mentioned constant repeated contact, friction, irritation, heat and moisture may constitute singly or together the necessary factors to produce the dermatitis which would not result from simple contact as occurs in the test.

It must be recalled too that only certain portions of the epidermis may manifest the hypersensitiveness, though as a rule, especially in sensitivities of high grade, the entire skin will react to the irritant. Hence positive tests at times may occur only on or near affected areas. Wise and Sulzberger[8] cited cases to illustrate this. In 3 women with contact dermatoses of the face due to powder, patch tests were negative on the arms, legs, and back but definitely positive on the V-area on the anterior surface of the neck. They believe that this location is most suited to patch testing in all cases of dermatitis about the head and neck. Similar examples of variations in the sensitiveness of the skin in different areas have been observed by numerous workers.

Spontaneous desentizations may occur, hence a negative test may be due to the fact that it has been applied to an area which is no longer hypersensitive. Sulzberger and Wise[7] stated that most of these processes seem to run in phases of extreme hypersensitiveness, lesser hypersensitiveness and normal non-sensitive reactions, and that periods of desentivity often follow or are caused by the acute flare up in the eruption which caused the patient to seek treatment.

Treatment:

As in other allergic conditions, the method of choice in the treatment of contact dermatitis is the avoidance of the causative agent, which in many cases is entirely possible (certain plants, foods, cosmetics, materials of clothing, individual soaps and washing materials, etc.). In other instances, however, especially in the occupational cases, it is impossible to prevent contact with the offending substances. As Wise and Sulzberger[8] stated, the shoemaker must "stick to his last" even though he is hypersensitive to leather and cobblers' wax. Changes or substitutions of industrial irritants to other compounds to which the patient is not hypersensitive, are occasionally possible. Some of these have been mentioned in the previous discussion about excitants. When the hands are effected, the wearing of gloves and adequate washing and drying may prevent or at least alleviate the condition. In some instances cure, without complete removel of the excitant, is impossible despite the best available methods of prophylaxis and logical dermatologic therapy. Desensitization which is successful in the case of certain excitants and unsuccessful in many others, is still more or less in the experimental stage.

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The Treatment of Diabetes Mellitus Among Railroad Employees*

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I HAVE been asked to talk to you today on the problem of the railroad diabetic and his management. Obviously, a diabetic railroad employee is different in no way from any other diabetic person as far as the disease is concerned, but the very nature of his work places him in a position where often times a question is raised as to his qualifications for work. Are the railroads justified in retaining a diabetic employee? Should he be discharged, or, should he be put in some position requiring very little responsibility? Are the railroads assuming an actual liability in retaining him? For many years these and other questions of similar nature have arisen for discussion among the railroad companies of the country. My interest was aroused in this matter when I reviewed the transactions of the American Railway Surgeons for the past ten years. They have been greatly interested in this and have given it a great deal of thought. The committee on disability and rehabilitation has made a report annually for ten years on this subject, and, in 1934, made a complete survey of the entire subject. For those of you who are not familiar with the report I should like to read a part of it:

"It has been impossible to determine with any degree of accurateness the incidence of diabetes among railroad employees; perhaps the nearest to a correct estimation is that reported by one observant who claims that .05 per cent of all trainmen have diabetes and that, if considered alone the engine men will show 1.7 per cent.

"The hazard presented by the diabetic in railroad employment presents three distinctive features: (1) The sudden onset of coma; (2) the likelihood of a prolonged disability following trivial injuries, particularly to the feet; (3) the fact that diabetics who require insulin in the management of their cases are subject to the possibility of a sudden insulin reaction at what may be a critical time.

"It has been found that there are a number of trainmen and enginemen, afflicted with diabetes, who maintain their physical fitness by a strict adherence to a properly prescribed diet under the surveillance of a competent medical adviser. As long as this can be accomplished without the administration of insulin it is believed that the employee may be considered as a fairly safe hazard. Failure to maintain a physical fitness by diet and the necessity of resorting to insulin, creates an unusual hazard in that a severe and sudden insulin reaction, leading even to loss of consciousness, is apt to develop, unless an absolutely proper balance is maintained between the carbohydrates and the intake of insulin. The committee feels and has recommended that any man in train service who is taking insulin shall be considered as unfit for such service, or services, as long as the administration of that product is required.

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*Presented before the Great Northern Railway Association, Glacier National Park, July 1, 1935.

"While diabetes is a most important factor in the development of railroad disability, your committee summarizes the result of its survey with the following recommendations:

"1. All applicants for employment in train or engine service should be subjected to a careful physical examination, including urinalysis.

"2. All re-examinations should include a urinalysis.

"3. The attending surgeon should make a urinalysis in all cases of injury.

"4. Engine and train employees suffering from diabetes and unable to maintain a physical fitness by means of diet alone, should be temporarily removed from service, pending a restoration to such fitness.

"5. Diabetics requiring the administration of insulin should be removed from any hazardous occupation so long as the condition requires the use of this product.

"6. Diabetics manifesting an increasing amount of sugar or any serious symptoms should be removed from train service until the condition is improved.

"7. Finding of acetone in any diabetic case is certainly an indication of an impending crisis."

You can see from the above report that the railroad diabetic is a very important problem and one in which everyone here should take a personal interest. Doubtless, at this very moment, you are asking yourself certain questions? The main question is undoubtedly whether or not the uncomplicated diabetic taking insulin should be removed from service. Of course, there is no question in anyone's mind that a diabetic with severe complications should not be permitted to work; but should the uncomplicated diabetic be removed simply because he is taking insulin. All of you know many diabetics taking insulin and holding responsible positions which they have held for years without difficulty. You also know that discharging an employee because he has diabetes and is taking insulin may be the very beginning of breaking his morale and practically shutting the door as far as future work is concerned. On the other hand, any recommendation which has for its purpose efficiency of service and safety for all, is, of course, the right one. We have here a real problem and I wonder if such a recommendation will be universally adopted. It seems to me that certain factors, such as the nature of work a man is doing, the severity of the case, the character of the individual, and the type of medical care, should exert a deciding influence. If the railroad knew that their diabetics, with or without insulin, were in the hands of competent physicians, might that not modify their attitude? Previous to this time competent men have been considered as those with special diabetic training or ones doing internal medicine. The reason for this was that diabetic management was considered to be a very complicated affair requiring too much time and energy for the busy physician. A physician competent to handle diabetics does not necessarily need to be a diabetic specialist. If a doctor has at his disposal a few simple principles of treatment and an intelligent co-operative patient, he should be able to treat the average diabetic in a perfectly satisfactory manner.

I noticed in the above report that the diabetic who can be properly controlled by diet is acceptable for service. This should raise a question in your mind.

Previous to the discovery of insulin the treatment of diabetes was by diet alone. Since the discovery of insulin, we have had more than ten years' experience with its use. During that time there has been a greatly renewed interest in the treatment of diabetes. The literature has been full of articles on this subject, and we have amassed a tremendous amount of information which has given a better understanding of the disease and treatment. You are all aware of what insulin has done to improve the status of the diabetic. We know now that many diabetics are leading an ordinary life because of insulin, and appear to all intents and purposes physically normal. These people are engaged in daily occupations and assuming positions of more or less responsibility without the loss of time. If we are to derive any good from all of the work of the past ten years, it is time we assimilated our knowledge and applied it to improving the living and working conditions of the diabetics as a whole. In my mind, it is our responsibility to keep the uncomplicated diabetic, who is employed, physically fit. This, I feel, is the great diabetic problem of today.

Why should we penalize the diabetic when we have such a drug as insulin? If all diabetic employees could be controlled by diet, I doubt if the railroad would have much of a diabetic problem. At least this is something which anyone handling a diabetic should think about.

Since it is not possible for all physicians to have special training in diabetic care, what is needed is a method of taking care of these people. If it is possible to have a method of treatment which will maintain the physical fitness of an uncomplicated diabetic, we should have a result whereby this great group of diabetic patients can be controlled. There is no doubt that, with your routine examinations, you will discover diabetes in its uncomplicated form which will give you a group of diabetics, some of whom may be controlled by diet alone, and some of whom will need insulin. Regardless of what the case is you will need a simple practical method which will brings results.

The selection of a method of treatment as a rule should be guided entirely by its effect on the group as a whole and not upon one individual. Under what might be called the ideal system, a patient is sent to a hospital, where he has the advantage of institutional care. This, however, applies only to a group of selected people and is not necessarily the most practical. If he is sent to a large medical center, his family physican at home may never be advised and the patient loses the advantage of care at home, where many times it should have begun. We must remember that diabetic treatment is not for just a period of one or two weeks, but is for the life of the individual, and the best treatment is the one which produces the best and most lasting results. Many times the patient who goes to the hospital is not financially able to do so, but if he does go, he goes for what is known as intensive observation. After careful laboratory studies are made, and tolerance determined, he is finally instructed by a trained dietitian in food requirements and given a diet list of elaborate proportions. He goes home with a pair of scales and good intentions of following out his instructions. After a short time, bills come in, rents come due, the scales are put away, the elaborate instructions forgotten, and he is again guessing at his diet. He goes back to his ordinary routine of life; he reverts to his former condition, and he has lost ground in spite of his ideal treatment. This, of course, is not always the case, but we have seen it happen so often that sometimes I wonder if it is justifiable, both in expense and loss of time from work.

On the other hand, we have what may be called the practical diabetic treatment, which results in the greatest amount of good in a large group taken at random. The more valuable treatment is not that which secures the best results in a small group, but that which obtains the best results in a large group. One cannot assume that the majority of diabetics are mentally capable or in a position to follow the ideal treatment, and if we are able to have our diabetics master a simple, practical treatment, we have often accomplished the greatest good. *The average individual will follow a prescribed treatment only in direct proportion to its simplicity.* Simplicity is also important from the viewpoint of the physician. The diabetic desires to look for advice and counsel to his own physician. If he can be under the care of some one he knows at home who is interested in him, and who is guided by a few simple rules of treatment, he is often a much better treated diabetic than if he were sent away for a short period of specialized care and returned with no medical care at home.

For the past ten years we have had a diabetic out-patient department in connection with the Minneapolis General Hospital. This has grown steadily until, at the present time, 500 diabetics are under our care. We were soon struck by the fact that we could not hope to send all of our patients into the hospital for care and diabetic instruction. It was necessary to develop a method whereby these people without diabetic complications could be treated in as successful a manner as was possible without hospitalization, and to allow them to go on leading normal lives, enjoying gainful occupations with a minimum loss of time. These diabetics come from all walks of life and are engaged in various occupations. They are a very representative group of diabetics, a cross-section of life, but, because of economic conditions, have needed relief medical care. I have had these people under observation for different lengths of time, some of them for the entire ten years. We have tested the various phases of diabetic treatment, and, as a result, have had the opportunity of developing a practical method of handling these people. We have been gratified to find that our plan has been successful in controlling the disease without loss of time and with very little effort on the part of the patient, unless the patient was not co-operative. And I would like to say right here that no diabetic treatment is of any value unless the patient co-operates.

I believe we have had some success in our treatment of the group as a whole, and, if this has been true, we have been using our knowledge of diabetes for the greatest good. There is nothing new or startling in our method of treatment, and it is very similar to methods used in other out-patient departments. It may not be ideal, but it is practical and workable, and can be carried out by any physician. The simple type of treatment, to my mind, is what is needed more and more in the field of medicine, for we have often been handicapped by too complicated methods of treatment. The physician of today finds very little help from the average textbook. He has usually turned to pamphlets which have been circulated by various drug firms. The difficulty with the pamphlet form of treatment is the fact that, usually, neither the patient nor the physician reads the pamphlet unless some emergency arises and neither of them take time to sit down and go over the material together. Undoubtedly, these might be of value in bringing a uniformity of thought to the physician, helping him in his treatment and aiding the patient in a better understanding of his disease, if both the doctor and patient understand what is in the pamphlet.

In treatment, nothing takes the place of instruction by the physician personally. Two or three things are accomplished by this method which can never be obtained by any other method. You impart to your patient a sincere interest in his case, a desire to be of help, and the fact that you are one who should be consulted in regard to his trouble. Furthermore, it is the fundamental rule of medicine that each patient is the most important in his own mind and the physician must make him feel that he is the most important in the physician's mind. This applies to the diabetic as to no other case. One of the greatest troubles in the past has been the fact that the physician did not take the time and energy to assimilate a few fundamentals of treatment and, therefore, could not care for the disease properly or be interested in treatment. Nothing can take the place of the doctor as a personal health adviser. Every effort must be made by the physician to have the patient report to him at regular intervals. This applies to all diabetics.

Thus, in a very brief and sketchy manner, I have tried to present a broader viewpoint on the diabetic question. We are faced with many hundreds of diabetics, people in moderate circumstances, who must work for a living, and it is our duty to care for them. I do not see why we should discriminate against the average diabetic, if we can find a way to keep these people physically fit. I realize there are exceptions to this idea, but I must remind you again, I am speaking of the average uncomplicated diabetic. In the next few minutes I should like to tell you our simple method of treating this group of diabetics.

In the beginning, we must keep in mind that the treatment of diabetes is greatly influenced by some factors not related to the disease itself, which have a tremendous influence on the course of the disease and its successful treatment. By that I mean such factors as home environment, economic situation, emotional instability, emotional reaction to their condition, and reaction to physical limitations. All these and many more serve as unforeseen and uncontrollable barriers to successful treatment. If a physician will keep these constantly in mind he will be more tolerant and charitable toward his patient, and this will help him greatly in obtaining co-operation and success. We feel that this is of such importance that we are constantly on the alert, watching for these influences.

On entrance to our clinic, a careful history is taken, a physical examination is made, and the patient weighed. May I emphasize the importance of weighing a patient. A 24-hour sample of urine is collected and tested for sugar, acetone and diacetic acid. A fasting blood sugar is taken. If these are done, one has all of the data necessary to begin treatment. It is not advisable as a rule to place the patient showing acidosis upon ambulatory treatment, but he should be classed as a patient with complications and put on special care. The clinical data are of as much importance as the laboratory data, and as far as the laboratory data are concerned, simple methods are all that are needed. We still believe that the basis of all diabetic treatment is the diet.

What are the requirements of an adequate diet? (1) Sufficient calories to maintain normal weight and provide energy for work; (2) sufficient protein to build and repair the body tissue; (3) minerals, vitamins, residue and water, and (4) that it conform as largely as possible with the ordinary every-day diet that the family is eating. We make no attempt to estimate the basal caloric requirement of the individual. Our ultimate aim is to obtain normal weight and srength for the diabetic. This figure for normal weight can be obtained from any standard life insurance table.

A few words in general about diet, I feel, is appropriate at this time. During the past ten years we have seen almost every combination of carbohydrate, protein and fat diet tried. The ones thought of today are the high fat diet of Newburgh and Marsh, and the high carbohydrate diet as advocated by Rabinowitch and Sansum. All of these have their followers and each has produced equally good results in the hands of their advocates, but, fortunately, as in every other therapeutic measure, we are swinging back into a middle ground using a diet which is moderate in carbohydrate and moderate in fat value. The important thing to remember in the matter of diet is to obtain sufficient calories and a balanced diet. We know that the high fat diet gives a larger number of calories with a lower total glucose value than does the high carbohydrate diet. The high carbohydrate diet is sometimes preferred by the patient, but we know that the high fat diet requires a smaller number of units of insulin than does the high carbohydrate diet. The advocates of the high carbohydrate diet are correct in the statement that insulin has a tendency to activate relatively more glucose as the carbohydrate value rises, but the fact remains that these diets require larger doses of insulin.

As I said before, we are concerned mostly with calories and a balanced diet. We are using a diet at the present time that is not the high fat diet but which has a tendency to increase in the amount of fat. For we are confronted with the problem of giving the best diet with the greatest number of calories at the least cost, using the smallest amount of insulin. These factors are important to any diabetic whose earnings are small. It conforms as nearly as possible to the ordinary home diet and it is given in measured quantities. We do not believe that the weighed diet is necessary and at times a pair of scales gives a diabetic an absolute inferiority complex, since he feels he is set apart from the rest of the family. And I wish to emphasize that while we desire our diabetic to adhere to a diet we do not want him constantly reminded of his illness by any unnecessary preparations of food. The error which may result in the measured diet is as a rule inconsequential in its effect on treatment.

We have four simple diets. These I have placed in your hands together with a list of food substitutions. Please notice that we have a tendency to higher fat value. This is not the high fat diet. These diets are very palatable, contain all the essentials of an adequate diet, are low in cost, and conform to the average household diet. We have found that we obtain the greatest number of calories at the least insulin cost. In starting treatment, a patient is given the first diet slip. He is told how to test his urine and advised to return in from four to seven days. On his first diet he may naturally lose a little weight but nothing of any importance. At the end of that time another 24-hour specimen of urine is tested. If this specimen shows sugar you will immediately know that insulin will be needed for his further treatment, since the caloric value is so low. Accordingly, insulin is given. We do not determine the patient's tolerance for the ordinary treatment. As you know the tolerance of a diabetic is the maximal number of grams of glucose from all sources that can be oxidized in 24 hours without insulin, after the subject has had full opportunity to recover from interfering factors. This is a hard thing to do in the out patient service.

If the patient shows evidence of moderate amounts of sugar in his urine, we begin usually with ten units of insulin morning and night, 20 minutes before breakfast and 20 minutes before the evening meal. A physician should have no fear in the use of insulin if he will use it with judgment. You must remember a normal individual can take five to ten units of insulin before each meal and have no bad effects. Since this is so, the diabetic can surely start with that amount. Another few days are allowed to elapse on this treatment when the urine is tested again. It is important that the diabetic eat the entire full diet but no more. If at the end of this time he is sugar-free, the insulin is held constant and the next diet in order is given. If he is not sugar-free, insulin is given three times a day, the dosage increased, and the diet kept the same until such time as he is sugar-free. When he is sugar-free, the insulin is kept constant and the next diet given.

His weight is watched, and the ultimate result to be obtained is a normal weight, sugar-free urine, adequate diet, and proper insulin dosage. If the diabetic is overweight he should be held on an inadequate diet, but sugar-free, and allowed to burn up some of his bodily tissue.

You can obtain the result desired easily if you will use one of these four diets and not be afraid to use adequate insulin. We divide our diet so that each meal is practically equal in carbohydrate, protein and fat value, and we try insofar as possible to give the insulin in equally divided doses two or three times a day. It has been repeatedly shown that small doses of insulin at intervals give better results than a single large dose. Occasionally you will find a diabetic that is hard to control because he seems to burn his sugar irregularly, and you may have to adjust the size of the dose. An easy way to do this is to test single specimens just before and two hours after each meal, and you can readily determine when the larger and smaller doses of insulin should be given. Many times the largest dose will come before breakfast. You will immediately ask what about the blood sugar. In the majority of cases, it usually runs somewhat parallel to the urinary sugar, but it may vary from day to day. If any importance can be attached to it, it is of value in estimating the threshold. By threshold is meant the height of blood sugar at the time sugar is first spilled into the urine. Occasionally one finds the condition of "high threshold." That is most often found in the arteriosclerotic and elderly diabetic. Occasionally this may be found in the younger diabetic also. Be careful in giving insulin or increasing it in patients who are free from sugar in their urine just because of an elevated blood sugar. Blood sugar will vary in individuals. It may be possible for an elderly diabetic to carry a blood sugar above the normal for a young person. We have found that the elderly diabetic would appear to feel better if he were allowed to show small amounts of sugar in the urine and he is usually perfectly safe in doing so.

You will notice that in the list of substitutions the foods are divided very much as you have been used to seeing them. They are all average servings. If these are used along with the diets and the amounts substituted correctly, the patient can enjoy a diet of the widest variety.

We have found that by using this method we have been able to place our patients on a dietary regime in a minimum amount of time. All patients are taught to test their own urine, using the Benedict test. They are taught to give themselves their own insulin and instructed how to tell a reaction and what to do for it. These patients are watched at intervals checking their weight and urinary sugar. We know that if a patient will co-operate by following an adequate diet and taking the prescribed dosage of insulin he can be maintained in a satisfactory physical condition. You will be surprised how quickly the diabetic will learn his own problem and how interested he will be in taking care of himself. In fact, he will soon learn how to adjust his own insulin to control his urinary sugar. In any diabetic under treatment the diet will have to be varied slightly from time to time and the insulin adjusted, but usually this can be done very easily. One thing must be remembered, if a diaebtic is doing some unusual physical exertion, he may require less insulin, as work metabolizes carbohydrates. However, as a rule, everyone's work is a fairly constant factor, but keep this in mind.

The one great fear which everyone seems to have in the treatment of diabetics is that of insulin reaction, but I believe that this is much overrated. A diabetic soon learns his own treatment so well that he can take care of this with little difficulty.

There are also other phases of the diabetic regime, which time will not permit me to discuss, and do not relate to my subject, because I am speaking of the big problem, that of the uncomplicated diabetic. A railroad diabetic with complications is a case requiring special consideration, and I believe is more than just a railroad problem. These people, of course, have no place in railroad work, but it is well known that a well controlled diabetic is much less prone to these complications than an inadequately treated case. However, I cannot terminate any diabetic discussion without saying a few words in general about these complications. First, as regards coma—this complication usually is more common before the age of 40 and not so common past that age. It is most often the result of some infectious process or carelessness on the part of the patient. Its treatment is known to you all. We believe that small frequent doses of insulin are better than larger infrequent doses. It is well to watch the blood pressure in these cases, for they often rapidly develop vascular collapse when the findings of coma seem to be improving; one must be constantly on the alert to support the circulation. Second, the arteriosclerotic changes—these are usually seen after the age of 40. They manifest themselves in cardiac changes, blood vessel disorders of the extremities, and the eye complications. The chief arteriosclerotic changes in the heart affect the coronary arteries. Nathanson has made a study of our diabetics from a coronary standpoint and has concluded "that coronary sclerosis is the predominating cardiac lesion of diabetes mellitus. It is usually seen after the age of 50 where its incidence is approximately 50 per cent. Above the age of 50 the incidence of coronary disease is six and one-half times greater in diabetics than in non-diabetics. Hypertension is not a prominent feature in diabetes. Electrocardiography is suggested as routine diagnostic procedure in elderly diabetics." Remember also that coronary disease in the diabetic will often be aggravated if diabetes is too strictly controlled. The arteriosclerosis in the extremities produce pain, ulceration and gangrene. You are well acquainted with these. The conservative treatment should be followed, as far as possible, massage, postural exercises, alternate foot baths and Pavaex treatment. When gangrene develops, be certain no infection exists under the black necrotic area if amputation is anticipated, and treat the infection per se before amputating. Never forget to give gas gangrene antitoxin before amputation. The eye changes are those in the retina due to arteriosclerosis and hemorrhage. We believe that adequate diabetic treatment is the one to follow in these cases. We have not found that over-treatment or under-treatment gives any better success. In the lens there are definite changes in size due to carbohydrate content and one must remember this when patients complain of vision changes.

I have tried, in this short time, to present a few problems confronting the diabetic. I believe an improvement in the general status of the diabetic could be brought about, by giving the diabetic a better opportunity for treatment. The impressions I have gained have not been obtained statistically, for this is hardly possible, but, I believe, clinical impressions, after all, count for a great deal in practical therapeutics. They have been gained by watching and talking to the people month after month for a long time, and also by exchanging ideas with those associated with me. These people constitute the average diabetic patient of today. The success of the treatment depends upon the influence and fitness of the physician, and the willingness of the patient to cooperate, and above all, on its simplicity. That, in a nutshell, is the whole diabetic problem. I believe that the problem which confronts the railroad is similar; either to adopt the recommendation of the committee or attempt to keep these men in service, but insisting on two things: (1) A familiarity of the various railroad physicians with the treatment of diabetics, and (2) co-operation on the part of the employee in the treatment.

If these could be obtained, I believe that certain diabetic employees could be maintained in physical fitness with the use of insulin and kept in service. If the diabetic employee is a co-operative employee, he should be a good diabetic and a good employee. It is recognized that a co-operative diabetic is usually an outstanding person in his community. If he does not co-operate he is not a good employee. I realize that diabetic trainmen are prone to suffer from the same complications as any diabetic. They may have insulin reactions; they may have coma; they may have arteriosclerotic complications, but I believe that one of our greatest factors in producing these complications has been that our physicians have been confused by the mass of literature and figures, and they have not had a few simple rules to follow which would permit them to keep the diabetic from having a great many complications. We usually find that if complications arise, it is often the result of carelessness due to a lack of understanding of the treatment. One reason we had so many complications in the past was because we did not have a simple method the diabetic could and would follow. We must learn that successful diabetic management, which previously seemed to be difficult, is in reality, simple.

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Treatment, Prognosis and Prevention of First Infection Type Of Tuberculosis*

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Treatment

Treatment Unnecessary. Fifteen years ago, we were very enthusiastic about the necessity for treatment of children who had the first infection type of tuberculosis. Then we believed that it would be possible to hasten resolution of the recent pneumonic lesions and to secure more permanent healing of those which already presented evidence of calcium deposits. The construction of special children's buildings on sanatorium grounds, the building of preventoria, the opening of special schools, the establishment of fresh-air classrooms, and the organization of summer camps, were accomplished at an expenditure of huge sums of money. Up to that time, no one had actually observed a group of children over a sufficiently long period of time to determine whether the course of the first infection type of disease could be altered by any form of treatment.

Since that time such studies have been made and have shown that it makes no difference whether children who have the first infection type of tuberculosis are given strict bed rest in a sanatorium and even have collapse therapy instituted whether they are placed in a special school or whether they remain at home under the same conditions as normal children should have. The course of the disease is the same; that is, lesions which can be demonstrated by X-ray film resolve in the same manner; calcium deposits are laid down in the lung parenchyma and in the lung hilum in the same manner and at the same rate regardless of the treatment instituted. Moreover, it has been shown that no matter how long such children are kept on strict bed rest, even with collapse therapy added, one neither alters that very dangerous factor, namely, the sensitization of tissues nor destroys the tubercle bacilli laid down in the original focus and in the regional lymph nodes. Neither is there any evidence that the foci of bacilli are more quickly, more completely or more permanently walled off when strict bed rest is employed or any of the other therapeutic procedures than when the child remains at home under the ordinary conditions of life; that is in all groups treated and untreated, sensitiveness of the tissues to tuberculo-protein persists and tubercle bacilli remain alive and virulent, ever ready to produce reinfection destructive type of tuberculosis once they are set free upon sensitized tissue.

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Febrile Reactions—The first infection of tuberculosis in the pneumonic stage is rarely diagnosed when fever is present, except in the relatively few cases who have high temperature elevation. When the disease is detected in the febrile stage, it is only reasonable that the child should be treated just as when fever is caused by other infections, such as influenza. Since the febrile stage usually is of such short duration, the treatment can very well be carried out in the home, provided there are no uncontrolled sources of exposure among the associates, and other home conditions are good. The red-cell sedimentation rate has been found to be definitely elevated during the febrile stage and some authors are strongly of the opinion that the treatment should be continued until the rate has returned to normal. However, the ultimate results in our cases have been equally good whether or not treatment was administered. In no case have we resorted to collapse therapy in any form. At present, we can see no indication for such treatment.

Lymanhurst Studies—When our work at Lymanhurst began in 1921, we strongly recommended sanatorium care for every child who was found to have a focus of first infection tuberculosis in the pneumonic stage. Many families refused to carry out our recommendations because there were no outward manifestations of tuberculosis. We then advised that their children who were old enough be admitted to the Lymanhurst School. Many even refused this for the same reason and insisted upon having their children remain at home with no treatment whatsoever. Thus, our children were divided into three groups, which have given us an unusual opportunity to observe the effects of treatment upon the first infection type of disease. The first group consists of those whom we sent to sanatoria, the second of those sent to a special school (Lymanhurst), and the third of those who remained at home with no treatment except that every effort was made to break the contact when an open case of tuberculosis existed in the home or among other close associates. This same effort was exerted in all cases.

In fact, in a group consisting of 155 children who have been observed from the time the disease was in the acute inflammatory stage until lime or fibrous strands were deposited in sufficient quantity so that they could be visualized by the x-ray film, 19 were treated in sanatoriums; 50 in the Lymanhurst School, while 86 remained in their homes. Of the 155 children, 136 were traced recently while the remainder (11, no institution, eight, Lymanhurst) have moved away or for some other reasons could not be located at this time. Among the 136 traced, we are unable to see any difference in the course of the disease, regardless of whether the children were treated as strict bed patients, were sent to a special school, or remained as active as any normal child is in the home. In fact, with the exception of three who developed the reinfection type of disease, the entire group traced in 1935 are apparently perfectly normal, healthy individuals, going about the activities of life just as other children in their communities who have not had tuberculosis.

Moreover, we have not been able to obtain any evidence to show that hospitalization, special schools, summer camps, or any other form of treatment except breaking contact with tubercle bacilli has any influence upon the later development of reinfection type of disease. In fact, our only fatal case died of tuberculous meningitis in a sanatorium after having been there many months and the two cases who later developed reinfection, chronic, pulmonary tuberculosis in adult life, were given long periods of treatment in sanatoria for the first infection type of disease when they were children. In addition to this group of children, whom we observed from the time their disease was in the pneumonic stage until the present, we have had under observation another larger group of children who had the first infection type of tuberculosis in the calcified stage when our observations and treatment began. In this group, we have also been unable to see any difference between those treated in institutions and those who remained at home.

Originally, the Lymanhurst School for Tuberculous Children had wards, where children could be hospitalized. Observation, however, revealed the fact that there was no real necessity for such service and, therefore, the staff members unanimously agreed that it should be discontinued. The school was retained as the treatment division where children were carefully observed but at the end of thirteen years of such observation the medical staff came to the conclusion that the child with the first infection type of tuberculosis needs no special treatment, either in a hospital or a special school, such as Lymanhurst. Although many staff members were enthusiastic about the school and were very desirous of having it continued, the actual facts convinced them that it was not necessary and, therefore, they could not conscientiously ask that money derived from taxation be used for the maintenance of the treatment division. This resulted in a false rumor now extant that Lymanhurst has been closed.

The staff then strongly recommended that at least a part of the funds previously used in the operation of the treatment division of the institution be diverted to two activities, which observation had proved would yield the most in tuberculosis control. The first consists of administering the tuberculin test to a much larger number of children than had previously been done to detect as many as possible who have been contaminated with tubercle bacilli; to carefully examine and follow such children and to put forth great effort to find the source of their contamination through examination of their associates. The next procedure is to treat or isolate as many as possible of the clinical cases found. This, we believe, to be the best method of treating infected children of any community. It simply consists of breaking contact with the open cases of tuberculosis, giving those already contaminated a better chance to avoid the reinfection type of disease, and preventing others from becoming contaminated. The second activity consists of making frequent x-ray film examinations of all who react positively to the tuberculin test as the period of adolescence approaches and thereafter in order to detect the reinfection type of disease early when treatment may be administered most successfully. Hence, Lymanhurst is now a diagnostic and epidemiologic center.

The failure of treatment to influence the course of the first infection type of tuberculosis is being recognized by a good many tuberculosis workers with the result that already in this country some buildings constructed for children on sanatorium grounds have been closed and later re-opened for the isolation of patients with pulmonary tuberculosis in communicable form. Such action is being contemplated by a number of other institutions. In Puerto Rico the institutions for children who have only the first infection type of tuberculosis are now being used for adults with communicable disease. When it has been shown that treatment over a long period of time in special institutions for tuberculous children has not modified the course of the first infection type of disease, how futile it is to hope that the summer camp would be of any benefit. Nevertheless, in this country there now exist in the institutions for tuberculosis 11,647 beds for children, such as sanatoriums, tuberculosis departments in general hospitals, and preventoriums. During the year 1934, 12,629 children were admitted to these beds: 1,191 had adult type tuberculosis; 6,659 childhood type; 824 extrapulmonary lesions; 3,236 were non-tuberculous; and 701 were unclassified. There is grave doubt whether any of these children except the 1,191 with adult type tuberculosis and the 824 with extrapulmonary lesions should have occupied beds in these institutions, not only because of the fact that the 6,659 with childhood type disease probably would not need any treatment, as well as the 3,236 non-tuberculous cases, but also because the survey by the Council of Medical Education and Hospitals of the American Medical Association, called attention to the fact that some of these children were being exposed to adults who had open tuberculosis or to other children even in preventoriums, who were admitted with the adult or re-infection type of disease. Moreover, sanatorium and hospital beds are too much in demand for patients with tuberculosis in a communicable form to have them occupied by those only suspected of having tuberculosis or having only the first infection type of disease.

Prognosis

In childhood, as well as in infancy, the *immediate prognosis* of the first infection type of tuberculosis is excellent. In fact, we have not yet seen a child die of this type of tuberculosis per se. However, recently developed lesions in this age period, as well as in infancy, produce a high degree of sensitization of the tissues to tuberculoprotein and in a few who have them, acute reinfection forms of tuberculosis develop, such as meningitis, miliary disease and tuberculous pneumonia. Therefore, one must be on the lookout for such forms of the disease among all children reacting positively to the tuberculin test and particularly among those whose tissues have recently become sensitized. However, an extremely small percentage of contaminated children develop these acute highly destructive forms of tuberculosis during the period of childhood.

The *remote prognosis* of the first infection type of tuberculosis in childhood is also excellent, since in adult life likewise, one rarely sees the first infection type of lesion that has caused any illness whatsoever. However, because of the fact that the tissues of the body remain sensitive and the first infection type of lesions harbor living and virulent tubercle bacilli, there is always the possibilty that these bacilli may be liberated and find lodgment on allergic tissues where they set up reinfection and often very destructive chronic forms of disease. Bacilli may be liberated through the rupture of a capsule which previously has adequately imprisoned them. Such rupture may be the result of trauma. Again, there may be the burrowing through of the contents of the capsule, such as deposits of calcium with sharp edges. These deposits in the form of pneumoliths are sometimes actually expectorated or may be aspirated into a ramification of a bronchus where they have occasionally been found to produce foreign body abscesses. Obviously, such cutting through of the capsule may liberate caseous tubercle bacilli containing material. Sweany has shown that after a time, there may be absorption of the capsules surrounding the first infection foci to such an extent that tubercle bacilli are set free. This is true even when the capsule contains calcium or true bone. Thus, there are many possibilities of tubercle bacilli escaping from lesions of the first infection type. This does not affect the remote prognosis as far as the primary lesions are concerned but very materially affects it as far as new lesions of the reinfection type are concerned. Indeed, the remote prognosis of children reacting positively to the tuberculin test is not particularly good. However, the bad effects are not experienced except rarely, until the period of adolescence approaches and thereafter. Beginning with the approach of adolescence, reinfection chronic pulmonary tuberculosis begins to make its appearance much more frequently than at any previous time and increases in prevalence until it reaches its height, about twenty-five or thirty years. It then continues to be a very prevalent disease throughout the span of life. The following case serves to illustrate this fact.

On May 31, 1921, a boy of twelve years was admitted to Lymanhurst as the first patient. His mother had died of tuberculosis and the tuberculin test showed that he had the first infection type of disease. X-ray examination of his chest showed unmistakable evidence of lime deposits in the right lung hilum. After a time he was discharged from the Lymanhurst School well immunized and vaccinated, as we thought. Approximately ten years from the time he was admitted to the School, he was taken to the Minneapolis General Hospital because of illness and examination revealed extensive pulmonary tuberculosis involving much of the left lung and a small portion of the right lung. This was of the adult type which later caused his death. Neither the positive tuberculin reaction nor the so-called vaccination scar, represented by calcium deposits in the right hilum, prevented the development of destructive tuberculosis or allayed the progress of his disease. Thus, our first Lymanhurst case for whom we had rendered such an excellent prognosis based upon opinion rather than fact, shattered our earlier teachings as many others have since done.

The children who react positively to the tuberculin test are much more likely to develop the reinfection destructive type of disease during and after adolescence than those who react negatively. In a group whose observations began in 1921 when the average age was approximately eight years, it was found that those who reacted positively were five times more likely to develop the clinical type of disease by the time they had reached their majority than those who had reacted negatively to the test. In fact, when only those examined in 1921 were considered, approximately 10 per cent who were positive to the tuberculin test had fallen ill from clinical tuberculosis by 1935, whereas, only slightly more than one per cent of those who reacted negatively to the tuberculin test in 1921 had developed clinical tuberculosis by 1935. Therefore, every physician, whether he be engaged in private practice or in some other phase of medical work, can readily see the significance of detecting the group of children who have the first infection type of disease through the tuberculin test. They are not ill at the time, nor will they fall ill with this type of tuberculosis, but many of them will later fall ill with the reinfection type of disease. This necessitates very careful examination of this group during the age periods when the reinfection type of disease becomes prevalent.

In fact, Opie has demonstrated calcium deposits in 98 per cent of cases who had the reinfection type of pulmonary tuberculosis. Rathbun has shown that among the boys and girls of high school age who develop the reinfection and fatal type of tuberculosis, old childhood lesions with evidence of calcification could be demonstrated by x-ray film in 50 per cent of the cases. From his experience which is large and his judgment which is excellent, he believes that the small percentage of girls and boys who have the first infection type of tuberculosis, furnish at least 75 per cent of the teen age girls and boys who develop the reinfection type which often is fatal.

Prevention

Inasmuch as there is so little that we can do to control tubercle bacilli once they gain entrance to the tissues, the only logical procedure is to prevent the first infection type of disease among children through avoidance of exposure to tubercle bacilli. Already much has been accomplished as evidenced by the fact that the number of children who react positively to the tuberculin test in many parts of the country is rather rapidly becoming smaller. If this kind of work is carried to its logical conclusion, the time is not far distant when the child whose tissues have been sensitized to tuberculo-protein will be quite rare in these communities. In most of these communities, the veterinarians are already doing their part to protect children against tubercle bacilli of the bovine type.

Medical Program—The work of the medical profession consists of finding all open cases of tuberculosis in the community as well as those persons who have the disease in the pre-symptom stage but may later be spreaders of bacilli. The finding of such cases has become a very simple matter as far as examination is concerned. Nearly all of them are positive tuberculin reactors, therefore, it is necessary to examine only this group of reactors. In communities where it is impossible to examine the entire population, there are certain leads which the physician can follow. One is the testing of all school children. This is valuable because an open case of tuberculosis cannot exist long without infecting the children of that home. Therefore, when one finds the children reacting positively to the test, one very frequently finds that some member of the family or other close associate has open tuberculosis. Where funds are limited in families or communities so that it is impossible to administer the tuberculin test to all children, it has been found very profitable, from the standpoint of finding open cases of tuberculosis, to test the youngest children in the schools; for example, those in the first and second grades. Usually the children of earlier ages have had less association with persons outside the home and the few who react positively are more likely to have contracted their infections from open cases in the home. When such cases of clinical tuberculosis are found they should be treated at once, or if the disease is too extensive, they should be isolated. In short, the spread of their tubercle bacilli should be stopped at the earliest possible moment. New sources of exposure in families will often be detected by periodically testing all school children who previously have reacted negatively to the test.

Examination of School Employees—While there probably is no more tuberculosis among teachers and other employees of a school system than among other groups in the same community, the fact remains that the teacher comes in intimate contact with large groups of other persons, such as fellow teachers and school children. Therefore, the danger of spreading tubercle bacilli to these contacts is not much less than when an open case of tuberculosis exists in the home. So often teachers have clinical tuberculosis in the pre-symptom stage. If examination is made compulsory and the disease is detected at this time, treatment is relatively simple. Many of them need be taken out of their work for only a short time and some not at all. In this manner, they are spared long periods of invalidism and the mental anguish of knowing that they have spread tubercle bacilli to their fellow teachers and their pupils. Again when such examinations are made compulsory, some teachers are found to have disease already in a communicable form. Perhaps they have never been aware of its presence. Only the occasional teacher knows that the disease exists and exposes children and other associates maliciously. All such persons should be given leaves of absence until their disease has been treated so successfully that it is no longer in a communicable form. They may then be safely returned to their work provided they are kept under close observation.

The only satisfactory manner is to make examinations compulsory for original employment and for reappointment. Each examination should include an x-ray film of the chest made by a first class technician and interpreted by a physician who is experienced not only in x-ray work but is well informed on the various clinical aspects of tuberculosis. Enough of this work has been done by such workers as Slater, Jordan and Ryan to prove that it is absolutely necessary if we are to give the teacher and school children of this country adequate protection. When such compulsory examinations were made in the Minneapolis school system, 68 employees with lesions definite enough to cause shadows on the x-ray film suggestive of reinfection type of tuberculosis were discovered. Final diagnosis in each of these cases must be made by the clinician based not only upon the tuberculin test and the x-ray film, but also upon laboratory examinations and careful clinical observation. Six of these employees were found to have tubercle bacilli in the sputum very soon after the compulsory examinations were made. The others are under close observation. In Decatur, Illinois, Lindberg found 1.3 per cent of the employees of the schools of Macon County had clinical tuberculosis.

In many states laws already exist requiring that teachers submit health certificates periodically. Unfortunately, such laws are not always enforced. Moreover, a health certificate made on the basis of an examination that does not include the tuberculin test and first-class x-ray films of the chest properly interpreted is of little value, since so many clinical cases of tuberculosis have neither symptoms nor abnormal physical signs. However, it is encouraging to find that in a good many places school boards are requiring adequate examination of all employees; for example, through the excellent work of Smith during the past six months, seventeen counties in the state of Kentucky have become definitely interested in the examination of teachers. In five of these counties already the tuberculin test with x-ray films of the positive reactors, or in lieu of the tuberculin test x-ray films of the chest, are a definite requirement for all of the 2,400 teachers employed. In South Dakota a very recent regulation was passed by the State Board of Health requiring all teachers to present evidence to the effect that they are free from tuberculosis in a communicable form. Dr. Dyar, epidemiologist of that state, after observing the response to this regulation states that he considers it one of the most valuable public health measures that the state has taken in a good many years. Another very encouraging fact is that the educators, themselves, have become interested and large numbers of teachers are being examined for tuberculosis by their private physicians. Following the examination of such teachers, many have become enthusiastic about having their pupils adequately examined.

In short, the prevention of tuberculosis among school children consists of avoiding contact with open cases of the disease in the homes, schools and elsewhere. Those who have already been infected will be benefited and some cases of reinfection type tuberculosis will be prevented from developing in their bodies through the breaking of contact.

Institutions and Summer Camps—The development of institutions for children with malnourished, anemic conditions, etc., was thought to be valuable in the prevention of tuberculosis at one time. However, there is not one iota of evidence to show that the building up of a child's body through care in these institutions, summer camps, etc., protects him in any way from infection with tubercle bacilli if he is later exposed to them. A good example is that of a child whom I observed for a number of years because of tuberculosis in the family. This child has always been overweight and her general appearance is excellent, yet in December, 1930, she developed the first infection type of tuberculosis in the pneumonic stage clearly demonstrable by the tuberculin test and the x-ray film. This came under control without the appearance of any symptoms. In 1934, she developed acute appendicitis and was treated surgically. In 1935, she was hospitalized for several weeks while she was desperately ill from typhoid fever. With each of these conditions it was purely a matter of infection and the excellent general condition of the child did not protect her. The use of institutions and summer camps for children whose tuberculin tests are already positive will not influence the course of the first infection type of disease. Summer camps provide a worthwhile outing, particularly for children of the cities and such camps as are operated by religious organizations, luncheon clubs, etc., are to be highly recommended, but the expenditure of funds derived through the sale of Christmas seals or from taxation in the name of tuberculosis is to be be condemned. A survey of tuberculosis hospitals and sanatoriums in the United States by the Council of Medical Education and Hospitals of the American Medical Association led to the following statement: "The preventorium service defeats its own purpose when it allows the admission of tuberculous contacts and childhood tuberculosis to the exclusion of open pulmonary cases."

Parsons, who has made a careful study of tuberculosis among children in England, says: "Children who can be removed from their homes should not be sent to a sanatorium unless it is one which only admits children, and in which there is rigid isolation of children with open pulmonary tuberculosis. In spite of all that is with truth claimed for sanatoria, there is in my opinion a chance that children may contract reinfections in them if for no other reason than that patients sometimes break rules; furthermore, many sanatoria are even less fitted to care for children than general hospitals."

False Pretenses—Our great trouble is that too much sentimentalism has been allowed to enter the field and too many health workers have used the appeal which the child makes in raising funds or securing appropriations for tuberculosis work. With our present knowledge of tuberculosis among children, it is perfectly obvious that this is not a fair approach. Workers who have been prone to take advantage of sentimentalism can make a much stronger appeal in a far more honest way by pointing out to those from whom they seek funds the great importance of finding open cases of tuberculosis in a community; of treating those cases, or having them isolated, thus, protecting not only the children, who need no treatment, but other members of the community. An illustration showing several children in the home where an open case of tuberculosis in the far advanced stage has just been detected through Christmas Seal Funds and immediately transferred to a sanatorium after which children are shown in the normal, healthy, home surroundings, would make a much stronger appeal. This would be far more reasonable, and would represent a more honest endeavor to secure funds than one showing the removal of those children to an institution, while the open case of tuberculosis remains in the community to continue to infect other children, as well as adults.

Futility of Treatment to Prevent Disease—In this class, there are workers who fight for what they term "poor dear children," whom they have gathered together in preventoria or summer camps. They frequently publish the total number of pounds gained by this group of children as though they were being prepared for the market. They make frequent photographs of these children to show how healthy they appear; how they have been able to tan their skin with heliotherapy, and use these photographs to convince those from whom they seek funds that their work is a great success. Their entire activities are centered upon 100 children or less, who are under their care. They have quite forgotten the many hundreds or even thousands of children, who are just as dear in their communities and who have been infected with tubercle bacilli; they also have forgotten the much larger number of children who are uninfected but need protection. When our work was begun at Lymanhurst, it was estimated that there were 20,000 contaminated children in the city of Minneapolis, yet our actual capacity for treatment was only 175. In addition to the 20,000 children contaminated, there were approximately 70,000 uncontaminated children who needed to be protected against infection. To have continued the treatment department of the school, which was found to be of no benefit as far as tuberculosis control is concerned, and to have provided no protection for 70,000 children and to permit possible reinfection of 20,000 children, would have been absurd. These workers in their enthusiasm for the small group whom they are trying to shelter, have failed to go out and find the open cases of tuberculosis who are continuing to infect and reinfect large numbers of children. How much more reasonable it would be to close the doors of such institutions for children, use the funds available, seek more funds, and institute a true case-finding survey in the community, stimulate the interest of all physicians and as quickly as possible provide institutional care for the open cases and treat all others adequately. This would very soon create a satisfactory environment for all children in their homes.

Very frequently the question is asked as to what can be done with the child who has been made an orphan through the death of one or both parents from tuberculosis. Should not all of these children be sent to preventoria? Before answering this question in the affirmative, one should consider that these children are not in need of treatment; usually, they are not spreaders of tubercle bacilli and, therefore, they do not need any special care so far as tuberculosis is concerned. Ordinary orphan homes are available in most communities but before recommending that a child enter either the preventorium or the orphan's home, one must not overlook the hazards of institutional life of the child. Attention has been called to these hazards by many workers. Those who are really interested in the welfare of the child will take such hazards into consideration and will arange a more satisfactory location for these children. The most satisfactory method, and a good deal less expensive method in the long run, consists of finding foster homes, where good care will be provided. All members of the family in such foster homes, however, should be carefully examined and found to be free from tuberculosis in a communicable form before any child is allowed to enter.

Desensitization—Several workers, such as Rich and Fernbach, have shown that it is possible through the use of tuberculin to markedly reduce the sensitiveness of the tissues. While no method has been devised which will desensitize permanently or is any practical method yet available, the possibilities of such a procedure are worthy of careful consideration. However, inasmuch as the reinfection type of tuberculosis in both acute and chronic forms so rarely develops during the period of childhood, there is very little need to consider desensitization until adolescence approaches and thereafter.

Vaccination with Bacillus Calmette-Guerin (BCG)—In 1908, Calmette planted a strain of bovine tubercle bacilli on ox bile-potato medium. In 1921 after this strain had been transplanted 230 times, the bacilli were avirulent but were still capable of causing sensitiveness to tuberculo-protein of the tissues of the animal body into which they were introduced. Because of the apparent protection produced in animals, Calmette and his co-workers administered BCG by mouth to infants who were likely to be extensively exposed to tuberculosis. They gave a dose of one cg. of an emulsion on the third, fifth and seventh days of life. They always tried to have the three doses administered before the tenth day, since they were of the opinion that the intestine absorbs the bacteria better at that time than during any subsequent time. *They also recommended that the infant be isolated from the source of exposure to virulent human tubercle bacilli for a period of four weeks during and following the administration of BCG.* In case the tissues of the infant did not become sensitized, as manifested by a positive tuberculin reaction, they administered one-twentieth to one-fortieth cg. of BCG subcutaneously, following which a positive tuberculin reaction was usually obtained in from six to eight weeks. In the event the sensitiveness of the tissues died out, they recommended that BCG be administered several times during the lifetime of the individual, especially during infancy. In short, an attempt was made to keep the tissues sensitive enough so that they would react definitely to tuberculin.

Since the original work of Calmette, large numbers of animals and children have had BCG administered. In fact, in Europe alone, this material has been introduced into the bodies of more than a million human beings. The reports from different parts of the world are very conflicting. For example, when BCG has been used to control tuberculosis among animals, some workers have reported excellent results; on the other hand, in this country where it has been given ample trial, it has been condemned and the veterinary profession does not consider it of any particular value in their tuberculosis control program among cattle. Conflicting reports also appear in the literature as to the effect of BCG when introduced into the bodies of infants and children. Some authors are very enthusiastic, claiming marked reductions in the incidence of the acute fatal forms of reinfection type of disease in infants. Others show little or no enthusiasm for such procedure after giving it what they consider an adequate trial.

The opinion has been voiced that the Lübeck disaster was due to BCG having regained its virulence rather than the introduction of the wrong material through error. The fact is quite well established that the virulence of the tubercle bacillus can be very definitely modified by environment. Indeed, this is the way Calmette reduced the virulence of BCG. It would seem quite logical that through further changes in environment virulence might be regained and even exceed that of the original bacilli. Inasmuch as first-class bacteriologists claim to have already restored the virulence of BCG, the subject is not one to be taken lightly but one for most serious consideration. We know full well that virulent tubercle bacilli when introduced into the body of an infant through exposure to an open case of tuberculosis are deposited in the lymph nodes, etc., and there may remain alive and virulent for decades, ever ready to set up destructive disease if they find lodgment upon sensitized tissues. The work of Robertson on this subject is most convincing. If this occurs so frequently with the virulent strains of tubercle bacilli, it would seem entirely logical that BCG might remain alive in the human body fully as long and that under the change of environment might completely regain its virulence or even have it accentuated. Since this is a rather strong possibility, any physician who recommends the administration of BCG or introduces it into the bodies of human beings is assuming a responsibility of great proportions.

When Calmette began his work on BCG, our knowledge of the dangers of sensitization of tissues to tuberculo-protein was very meager. Indeed, at that time most physicians still believed that a positive tuberculin reaction indicated immunity. Much excellent research has since been conducted on the subject of sensitization, which appears to have proved conclusively that sensitization of the tissues is a very dangerous factor in the development of clinical tuberculosis. Moreover it has been shown that sensitization is independent of immunity; that one may develop in the absence of the other and that the tuberculin test is not a test for immunity but only for sensitivity.

Without sufficient knowledge of the potentialities, Calmette and his collaborators started a huge experiment, that is, they introduced BCG into the bodies of large numbers of infants and children. This experiment is now in progress but, unfortunately, it will require at least two more decades before one can even begin to draw conclusions concerning the ultimate result of the introduction of avirulent, living tubercle bacilli into the human body. The only place where there is the slightest evidence that BCG has been helpful is among those groups of infants said to have had a definite reduction in mortality from acute, reinfection forms of tuberculosis. How much of this reduction is due to BCG and how much to isolation from sources of exposure during the first four weeks of life has not been definitely determined. However, we do know that results obtained by such workers as Grancher and Bernard through the use of certified foster homes, exceed those of any group treated by BCG. Moreover, we have the observations of Boynton, which show that where attempts have been made to protect infants against exposure in an entire state, the mortality from tuberculosis among those under one year of age decreased 88 per cent over the eighteen years preceding 1933. She calls attention further to the fact that in this state where BCG vaccination has not been used, tuberculosis mortality rates in children are lower and have decreased at a more rapid rate than that reported by Wallgren in Sweden with the use of BCG.

Since of all infants and children infected with tubercle bacilli, only a very small percentage die or even fall ill from tuberculosis before the age of ten or twelve years, and since the mortality from tuberculosis between infancy and adolescence has always been very low, to make any claims for the apparent good health of children during this age period on the ground that BCG was administered when they were infants is not justified.

Unfortunately, we have not worked diligently enough on the fundamentals of tuberculosis control as expressed by Calver: "Practically we have, as administrators, accepted defeat in the control of respiratory disease and are awaiting the discovery of some new vaccine, or other sure and easy process of creating an immune population that we will not have to bother about. While thus waiting for the laboratory to produce a solution, people are dying and morbidity rates do not decrease."

Practical Laboratory Aids for the Otolaryngologist*

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NOWHERE in the practice of medicine is the laboratory of greater value than to the otolaryngologist. Unfortunately the present economic situation has made it impossible to make full use of this aid to diagnosis. The purpose of this paper is to revive interest in this subject and to simplify the various phases of it. A text book on this subject written by a properly qualified person would prove a valuable addition to the specialty. Perhaps the most outstanding paper dealing with this subject was published by Connor[1] in 1931, and frequent reference to it has been made.

Blood Studies—Kopetzky[2] summarizes the Schilling differential as follows: "The Schilling test is to determine the portion of segmented (polynuclear) and unsegmented (staff) neutrophiles. The presence or absence of eosinophiles is also noted as the reappearance of these cells constitutes a favorable sign. A relative increase in the staff or immature cells is indicative of increased infection. Changes in the nuclei result from changes in the bone marrow."

It is to be remembered that white blood cells originate from three sources:

1. The granulocytes in the bone marrow.
2. Lymphocytes in the lymph glands.
3. Monocytes in the reticulo-endothelial system.

The role of the basophile is poorly understood. The appearance of the monocytes is a defense reaction usually appearing at the crisis of the infection.

Kopetzky has well emphasized the importance of the falling hemoglobin and drop in the red blood cells. I personally feel that most of us pay too much attention to the white and differential counts and neglect the hemoglobin. Kopetzky summarizes this information as follows:

1. Continued reduction of hemoglobin and red blood cells is an indication for transfusion following operation.

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2. Continued reduction following surgery strongly suggests a sigmoid sinus involvement in acute hemorrhagic mastoiditis.

3. Before operation is indicative of weakened resistance.

No constant rule can be laid down from the blood picture to establish surgical indications. Comparative counts are of much more value than absolute counts. For this reason complete blood studies should be made early and frequently. By doing this one is able to gauge accurately the severity and trend of the infection. We have all seen severe cases of mastoiditis with a low white count requiring surgery and other cases with high white counts subside promptly under conservative treatment. In general it may be stated that intracranial complications give a rise in the white count.

The role of the laboratory probably reaches its greatest importance in involvement of the blood stream. In this connection I would like to mention my own observations as an aid in outlining the best course of treatment. Kopetzky recognizes two types of acute mastoiditis as the acute hemorrhagic and the acute coalescent type. With the acute hemorrhagic type invasion of the blood stream may come early in the course of the disease and usually without destruction of the sinus plate. In this type of a mastoid the route of infection is through the small interosseous veins and the pathology in the sinus is usually that of sinus phlebitis rather than a frank thrombosis. This is the type of mastoid that we see so frequently during the influenzal epidemics. On the other hand, with the coalescent mastoiditis, the invasion of the blood stream usually occurs late in the course of the illness with actual destruction of the sinus plate and direct invasion of the sigmoid sinus from a perisinus abscess. Here the pathology is usually that of a frank thrombosis. That these two types of mastoiditis are separate entities is borne out by the blood picture. With the hemorrhagic type of mastoid infection and blood stream invasion we usually find a normal or lower white count with a rapidly falling hemoglobin and red blood count. In the coalescent type considerable elevation in the white count is found, varying somewhat with the age of the patient. In younger patients the white count reaches its highest limits. There is also diminution of the hemoglobin and red blood cells but this is not as marked as in the hemorrhagic type. In the hemorrhagic type inspection of the sinus usually shows a relatively normal sinus and Tobey-Ayer test is negative, because there is no obstructing thrombosis. In the coalescent type the sinus plate is at least partly destroyed, the sinus itself is discolored and frequently covered with granulation tissue as a result of a peri-sinus abscess. In this type of case the Tobey-Ayer test may be positive as a result of an obstructing thrombus within the sinus. My interest in this differentiation dates back to a case, a small boy, age 6, who was very sick with bilateral mastoiditis and blood stream invasion. Bilateral mastoidectomies were done, both sinuses were uncovered and appeared normal and the Tobey-Ayer test was negative. The child was very ill and I did not feel justified in doing any further surgery, particularly as I had no means of telling which sinus was involved. The white count ran regularly in the neighborhood of 4,000 cells per mm. and the hemoglobin falling to 50 per cent. Consequently we treated the boy with frequent small transfusions according to the hemoglobin and red blood cell figures, at no time allowing the hemoglobin to fall below 55 per cent. Under this treatment the boy progressed to compete recovery without formation of metastatic abscesses. A short time later another patient came in with evidence of metastasis in the hip but with only a unilateral mastoid infection. The mastoid and laboratory findings were practically identical with the former case, and as he already had a metastatic infection, this case was also treated with transfusion only, aside from draining the infected hip. This patient also progressed to complete recovery. Since that time three other cases of this type have been encountered and all have recovered to date. The chief objection to this method of treatment would probably be the danger of metastatic abscesses, but it has been shown in this type of case that ligation of the jugular and opening of the sinuses gives no positive insurance against such abscesses forming. This type of case always presents a serious surgical risk. In the acute coalescent mastoiditis with an actual thrombosis within the sinuses and a high white count, surgery is certainly the method of choice, as it always has been. While my experience with this condition is too limited to state with certainty that surgery should not be resorted to in those blood stream infections with low white count resulting from a hemorrhagic mastoiditis, I am convinced that transfusion is of much greater value in this type than the usual surgical measures on the internal jugular and sigmoid sinus. The value of transfusion lies in the restoration of the hemoglobin and the addition of anti-bodies. Ersner and Myers[3] suggest giving the donor an injection of foreign protein about seven hours previous to the transfusion in order to increase the anti-bodies in the blood stream.

Blood Cultures—Blood cultures should always be taken where any suspicion of a blood stream infection exists. The proper time to take the culture is at the height of the temperature or at the termination of a chill, under absolutely sterile technique. The doctor should always carefully check the technicians on this latter point, as contamination is very easy. For this reason it is advisable to take several cultures at the same time, as an excessive growth on one culture and not on the others would suggest contamination. The presence of streptococci in a blood culture is rarely due to contamination and most of these blood stream infections are due to the hemolytic streptococci. One should not overlook the possibility of other conditions being responsible for the positive blood culture, such as an associated erysipelas, scarlet fever, pneumonia and endocarditis. This is particularly true with scarlet fever. Repeated blood cultures should be taken, if necessary, as one negative culture by no means rules out the condition. When a positive blood culture is present the diagnosis is established but one should never wait for a positive culture before resorting to the necessary surgery, as there are many cases of blood stream invasion where it is impossible to get a positive culture. The reason for this is that the bacteria are rapidly destroyed in the blood and reticuloendothelial system. The percentage of positive blood cultures undoubtedly would be much higher if the cultures could be taken from an artery instead of a vein, according to Ballenger.[4]

Middle Ear Cultures—Much information is to be gained from cultures taken from the middle ear at the time of myringotomy. The best method of doing this is to thoroughly sterilize the external canal with alcohol and use the point of the myringotomy knife for the culture. Wirth states that the organism in pure culture can be obtained from the nose in 75 per cent of all cases, while cultures from the throat almost always give a mixed growth. The value of these procedures are:

1. Type of organism can be determined, which allows the otologist to be on guard for its particular infectious characteristics.

2. Many times the original infectious organism is overgrown by secondary infectious bacteria and the real organism is thus never found. Friedlander's bacilli and the diphtheroid bacilli are particularly prone to do this.

Cultures should always be taken in the course of mastoidectomy, particularly from the antrum. Many different types of bacteria are found, the usual ones being hemolytic strep, pneumococcus, staphlococci and strepmucosa-capsulotus. The organisms are best cultured on Dextrose brain broth, later planted out on blood agar to determine the hemolytic properties. There is some confusion as to whether or not the strepmucosa-capsuloti is the same as pneumococcus type 3. I think it is generally agreed that this is the case. The organism is best recognized by the process of agglutination, its bile solubility and its unusually large capsule, which can best be brought out by the use of thionin. This large capsule probably explains why these infections are so severe, inasmuch as the capsule offers more resistance to the anti-bodies in the blood. Dean states that all pneumococci type 3 are prone to develop a surgical mastoiditis, especially in children, but Page[5] reports a large series in which 82 per cent of this type of infection recovered without operation. Tuberculosis of the ear is more common than generally recognized and should be suspected where tuberculosis exists elsewhere in the body and in those cases where there is delayed healing or excessive drum destruction or granulation tissue. At times it is difficult to recover the organism and in these cases one must resort to animal inoculation. If granulation tissue is present a section of it may establish the diagnosis. Tuberculosis of the ear is most common in infants and is usually of the bovine type. I had one such case in an 11 months baby in which a large aural polyp was found, completely filling the external canal, in which a co-existing miliary tuberculosis was present. Tubercular bacilli were found in the discharge and section of the polyp was also positive, showing giant cells and bacilli.

Brain abscess usually gives rise to an increased white count. If the percentage of neutrophiles is high the outlook is very poor, whereas with a relative lymphocytosis the outlook is much better. The reason for this is obvious when we recall that the real purpose of the neutrophile is to combat the infectious organism, while the lymphocyte acts principally to remove detritus. Therefore, a return of the lymphocytes to the normal or higher, suggests that some organization is taking place, and wherever possible, it is advisable to carry an abscess case over into this stage before operating.

Spinal Fluid—Much of the information here given on the spinal fluid is taken from the article by Connor mentioned under reference one.

1. *Pressure*—This is roughly indicated by the rapidity of the flow through the needle or more

accurately by the manometer reading. Any increase in pressure is due to increased intracranial pressure. Pressure readings are of limited value and it should be remembered that it may be decreased in brain abscesses.

2. *Color*—Turbidity is caused by cells, bacteria or fibrin webs. A neutrophile count of 300 is sufficient to cause turbidity while lymphocytes will not, as is the case in tuberculosis.

3. Normal glucose is 45-85 mgs. per hundred c.c. This decreases in acute meningitis due to action of ferments resulting from cellular disintegration.

4. The normal chlorides, 720 to 750 mgs. per 100 c.c. An increase in the chlorides is an indication of renal deficiency, while a decrease means an invasion of the subarachnoid space. In tubercular meningitis this is of secondary importance only to the presence of bacillis.

The above tests may be used to determine the presence of spinal fluid in cerebral spinal rhinorrhea or otorrhea. Another practical point in this connection is that spinal fluid will not stiffen handkerchiefs due to the absence of mucous.

5. *Cytology*—The normal count is less than five cells per cubic millimeter, with no neutrophiles. Lymphocytes function chiefly to remove detritus and their presence is a favorable sign, except in tuberculosis. The neutrophiles act to destroy the invading organisms and this is an unfavorable sign. A low white count in the spinal fluid points to a circumscribed process. A brain abscess may show normal fluid or findings of a circumscribed meningitis. With a generalized meningitis the count may rise to such a height as to give a yellow fluid.

6. *The Spinal Fluid Culture Is Very Important*—A negative culture in the presence of other positive signs of a meningitis means that we are dealing with a protective mechanism and that there is some hope for the patient's life. The presence of the hemolytic streptococci is practically always fatal as is the pneumococcus type 3 and bacillas influenza. Smears and cultures should both be made on spinal fluid, as the intracellular character is lost on culture.

Albumin—Excess of albumin in the spinal fluid is of no diagnostic significance. The presence of globulin is pathological and points to meningeal irritation.

Blood Dyscrasias in Ear, Nose and Throat—Many of these cases which properly come under the care of the internist are first seen by the otolaryngologist as a result of the nose and throat symptoms. For this reason it is recommended that complete blood studies be made on all acute infections of the nose and throat in order to rule out any of these general conditions. By doing this, proper treatment can be instituted at once and the physician is protected in that he is able to tell the relatives of the seriousness of the case. Reference is again made to Dr. Connor's article in the differentiation of these conditions. "We are all familiar with the tonsillar swelling in leukemia, the adenitis of Hodgkin's disease or the severe glossitis which is found in pernicious anemia, acute leukemia, hemorrhagic purpura, metallic poisoning and severe sepsis.

(a) A granulocytic angina shows an absolute diminution in both granulocytes and lymphocytes, especially the former. The total count varies between 200 and 4,600 cells per cubic millimeter. The hemoglobin and red blood cells remain relatively normal. The seriousness of this condition, of course, is well recognized.

(b) Infectious mononucleosis—The blood picture in this condition shows a moderate leukocytosis of 11,000 to 26,000, with a relative lymphocytosis, due to the large monocyte count. According to Downey this cell is a mature functioning abnormal lymphocyte and may be distinguished from acute lymphatic leukemia, which shows a higher white count, immature lymphocytes and secondary anemia."

Urinalysis—Urinalysis should be done in every severe infection of the ear, nose and throat, not only as a pre-operative precaution but for the information gained. Many times an infection of the genitourinary tract is discovered which may explain the fever or other symptoms present in the case. Diabetics are very immune to pain. The edematous membrane seen in the nose is frequently the result of a tubular nephritis, especially in childhood.

Syphilis—Wassermann tests should always be done in any doubtful lesion of the ear, nose and throat, and particularly in those cases where there is a lesion in the larynx, abnormal scarification in the pharynx and palate, perforations of the bony nasal septum, perichondritis, perceptive deafness, delayed healing and as a pre-operative measure to radical surgery. Where a primary lesion is suspected dark field examination must be made.

Diphtheria—Culture should be made on every acute throat and should be repeated daily, if necessary, to get a positive culture. The culture is more apt to be positive if taken beneath the edge of the membrane. It is well to remember that diphtheria may be present in the absence of any form of membrane.

Fungus Infection—The diagnosis of fungus infections is frequently overlooked in diseases of the ear, nose and throat. This is very unfortunate, as these infections when treated specifically respond very well, and if not, failure is very common. This is especially true in the eczemas of the external auditory meatus. The usual fungi found in the ear are mucoracea or aspergillis nigre or fumigatus. Mycelium may occur in the external canal and are even found in the middle ear, producing mucoid discharge. Stevenson[6] reports several cases of mycotic infection in the sinuses, especially mucor-histoides, which cleared up under the usual measures of treatment. Monila albicans has been found in 31 per cent of cases of chronic bronchial asthma.

Actinomycosis is the cause for quite a few infections in the throat and neck. A high percentage of infections in the tongue and floor of the mouth are due to actinomycosis. The fact that Ludwig's angina is frequently due to actinomycosis is commonly overlooked in the care of this condition. Any suspicious lesion should be observed for the ray-fungus and sulphur granules. These are yellowish-white bodies. The granules should be mashed between slides and examined for the characteristic mycelium and spores, as it is hard to grow in cultures.

Dr. Weidman[7] gives the following excellent technique in the examination of mycosis:

(a) He states that the potassium hydroxide technique stands out. A small part of material is placed on slide and a drop of 10 per cent potassium hydroxide added. This clears the specimen and softens it so that it flattens out into a thin film. Should be examined immediately.

(b) For smaller fungi Giemsa stain may be used. A drop is placed on the slide and the material stirred into it. Stains the fungi and tissue blue and gives an exquisite differentiation.

(c) Gram stain is useful only for fungus cells of bacterial size, such as streptothrizes.

(d) Wet India technique useful to identify a capsule.

(e) Culture is valuable to produce large network of mycelial filaments. Saboriad's media is best. Its value depends on low p.H., which inhibits growth of contaminating bacteria and brings out characteristic of fungus colony. Crude maltose essential.

(f) Animal inoculation to determine if pathogenic.

Cholesterin crystals are found in three locations in ear, nose and throat work. These crystals have a characteristic appearance when seen under the microscope. They are perfectly clear, with very sharp, straight borders and when seen grouped together produce a so-called staircase effect. The material to be examined is placed on a slide, a drop of water is added and the material is macerated with a cover slip.

1. The presence of cholesterin crystals in the middle ear or mastoid is due to cholesteatoma, the importance of which is well recognized. Where it is difficult to get material for examination, the wash from attic irrigation may be centrifuged and examined.

2. Cholesterin crystals found in the irrigation of the maxillary sinus points to a dentigerous cyst. This should always be considered when we get a flaky, metallic appearing wash. When standing the crystals usually remain on the surface of the solution used.

3. Cholesterin crystals found in masses of the neck point to a branchiogenic cyst. This is a matter of diagnostic importance in distinguishing this condition from carotid body tumors.

Laboratory in Allergy—Dr. Feinberg[8] in his new book, through his laboratory work has disproven several of the current conceptions on the causes of asthma. His work shows that in the great majority of cases there is no hypocalcemia and the phosphates are also within normal limits. The normal blood calcium is 9 to 11 mgs. per 100 c.c. of blood and the phosphates 3½ to 5 mgs. He also states that the acid base balance is usually normal, as determined by the carbon dioxide combining power of veinous blood. Consequently, if these cases are treated as a hypocalcemia or as an alkalosis, the treatment will not be very successful. Dr. Feinberg also emphasizes the sputum examination in asthma which shows Kirschman spirals, Charcot-Leydon crystals and a large number of eosinophiles. Careful search for the tubercular bacillis should always be made in asthmatic cases. X-rays of the chest should be made, particularly to determine the presence of bronchiectasis.

Where nasal allergy is suspected, examination of the nasal secretions frequently will determine if such is the case. If the predominating cell is an eosinophile the probabilities are that we are dealing with an allergic patient. If, however, the neutrophiles predominate, it is more likely to be an infectious condition. It is occasionally possible to demonstrate an allergic sinus with the x-ray. Immediately after taking the film, the patient is given 1 c.c. of adrenalin. One-half hour later another picture is taken, and if there is marked reduction in the thickness of the lining within the sinus, it may be assumed that the condition is allergic.

X-ray—The value of x-ray is well recognized in all branches of medicine. It should be remembered that the x-ray is only an aid to diagnosis and that close correlation with the physical findings is essential to arrive at the correct diagnosis. Good films are, of course, an absolute requisite, as a poor film not only obscures the true findings but may cause misinterpretation of what is present. To obtain the best results the physician should, so far as possible, have the picture taken with the same machine, by the same technician, using the same technique in every case.

1. *Mastoid*—The mastoid bone should be x-rayed early in every infection of the ear. This should be done for several reasons:

(a) It is valuable for comparison with later films in determining the course of the infection.

(b) Various anomalies of the mastoid bone can be recognized.

(c) The type of mastoid, either sclerotic, diploic or pneumatic, can be determined.

In the event that surgery becomes necessary with compact bone, one should be prepared to do radical surgery. With diploic bone one should be on guard for metastasis, which may occur even in the absence of a sinus thrombosis. Pneumatized bone occasionally produces chronicity. In hemorrhagic mastoiditis x-ray evidence may be lacking due to the fact that there may be but little cellular destruction. It is difficult to establish surgical indications from films taken of a sclerotic mastoid. Serial pictures may be necessary in this type to bring out the best detail by stepping up the milliamperage as needed. Many men prefer to make stereo films of the mastoid, though Law[9] states that this is unnecessary. With the increase in our knowledge of petrous tip suppurations, the x-ray of this structure becomes increasingly important. The most information is obtained from a film of the base of the skull, in which both pyramids are shown at the same time and can be contrasted with each other. The technique for this view is well given by Taylor[10] and the reader is referred to his article.

2. *Sinuses*—To obtain the maximum information from x-rays of the sinuses it is necessary that more than one view be taken. If just a single film is made the most valuable position would be one between 23 and 35 degrees. The Granger line is brought out by taking a 17-degree view. A three-degree view gives a good picture of the ethmoids and frontal sinus. Lateral views should always be made in cases where a tumor is suspected. The so-called occipital-mental view gives a good projection of the sphenoid sinus.

The use of radio-paque substances, such as lipiodol, brominol or neosilvol is of value in certain cases. This may be introduced into the sinuses by the Proetz displacement method or by direct installation of the oil into either the antrum or sphenoid sinuses. The latter method, when these sinuses are involved, seems to be the most practical. When radio-paques are used the picture should be taken with the patient in the upright position, using a horizontal beam. In this manner one gets the greatest information as to the condition of the sinus mucosa.

3. X-rays of the chest and esophagus should always be made where a foreign body is suspected before bronchoscopy or esophagoscopy is attempted. By doing this the type and position of the foreign body can be accurately determined and a plan of removal formulated before instrumentation. In the case of non-opaque foreign bodies the problem is more difficult. In the lung a non-opaque foreign body produces certain characteristic changes which are well described by Pendergrass.[11] Non-opaque foreign bodies can frequently be identified in the esophagus under the fluoroscope, using a radio-paque.

4. Confirmatory evidence of a retropharyngeal abscess can be made with the x-ray due to the displacement of the soft tissues, using soft tissue technique.

5. The extent of a carcinoma of the larynx may be partly determined by the x-ray, using the same soft tissue technique. The therapeutic value of the x-ray is well recognized and will not be discussed here.

Biopsy—Biopsy should always be done where any suspicion exists as to the presence of malignancy, providing the patient is prepared to go ahead with the necessary measures of treatment.

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Some Cutaneous and Deep Reflexes of the Arm and Hand

Charles Gilbert Chaddock, M.D.
St. Louis, Mo.

THE history of the study and clinical evaluation of cutaneous reflexes since the first observations of Babinski on the cutaneous plantar reflex forty years ago, is well known. Examination of the more important cutaneous reflexes has become a matter of clinical routine. All known reflexes are of interest; some of them are at times of capital diagnostic value. With these facts in mind, I venture to call attention to some brachial reflex phenomena that, as far as I know, have not been described.

Deep and Cutaneous Reflexes of the Brachioradialis (Supinator Longus) Muscle—Trunk and arms nude. Arm conveniently supported and flexed to a right angle or beyond, with the hand midway between pronation and supination, and the limb relaxed as much as possible; or the elbow may conveniently rest on a table with the forearm held perpendicular by gentle contraction of the biceps and the brachioradialis relaxed. The examiner presses firmly with his fingertips or ball of thumb on the body of the biceps. This maneuver causes a more or less marked reflex contraction of the whole brachioradialis muscle; and this contraction is maintained for some time while pressure on the biceps continues, with ultimate relaxation in "fatigue." This reflex phenomenon also occurs with the forearm relaxed in extension, when the reflex contraction may be seen as a rounding-out of the muscle in the forearm, or, as evident to the examiner's touch, in a hardening of the muscle; its tendon near the wrist may likewise be seen to stand out.

This reflex contraction can be caused by like firm manipulation of the body of the triceps (paradoxic reflex) and, less strikingly, of lower portions of the deltoid; and it can be induced from the skin covering the biceps, triceps and deltoid when these areas are irritated by the point of an orange-wood stick, by pressure or by stroking.

The Cutaneous Hypothenar Reflex—With the subject's arm and hand in relaxation and fingers in moderate flexion, the examiner supports the dorsal face of the forearm in such a way that the radial side of his hand faces the hand under examination (Figure 1). In this position the examiner's thumb may be moved freely over the palmar surface of the forearm. The examiner presses the ball of his thumb *firmly* on the ulnar side of the palmar face of the forearm midway between elbow and wrist and *shoves* his thumb slowly and with firm pressure toward the palm. This maneuver causes more or less marked longitudinal dimpling of the outer surface of the hypothenar eminence that usually becomes more marked as the examiner's thumb nears the pisiform bone. The dimpling continues for some time while the exciting pressure is maintained and disappears slowly when the pressure ceases. With the fingers in relaxed extension, the dimpling is also induced by this manipulation, but it is less marked. Similar reflex dimpling occurs readily in response to irritation with the point of an orange-wood stick of the skin over the distal half of the ulnar side of the palmar surface of the forearm, and of the skin around and over the prominence of the pisiform bone.

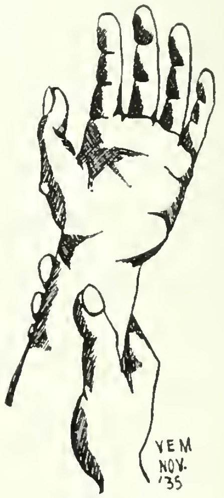

FIGURE 1

Finally, the reflex dimpling of the hypothenar eminence is most readily excitable from the cutaneous and underlying tissues of the third phalanx of the little finger, less so from the first and second phalanges. Slight scratch or pressure of the skin by a dull nail file or pointed stick brings notably quick response; likewise, firm squeezing, by the examiner's thumb and forefinger, at the end of the little finger. When the hand is supine and fully deflected to the ulnar side, hand in extention and fingers moderately flexed, squeezing the end of the little finger causes, with the dimpling of the hypothenar eminence, a noticeable movement of the pisiform bone toward the palm.* The reflexogenous zone along the ulnar border of the forearm and hand was found by assuming that it might have some normal analogy with the established reflexogenous zone along the outer border of the foot from heel to little toe.[1]

It should be noted that the reflexes here described occur in flexor muscles and are homologues of normal plantar reflexes.

These reflex contractions of the brachioradialis are clearly evident when the arm examined is lean and its muscles of moderate development. In a plump or fat arm they may be concealed; when the muscles are large, powerful, and in a high tonic condition, the reflex response to the manipulations is less obvious, perhaps because it is more difficult to obtain a state of relaxation of the muscles.

The pisiform reflex is described by Seiler in his article in Spiller's "The Eye and the Nervous System." This reflex is a marked dimpling of the surface of the hypothenar eminence when the pisiform bone is pressed upon and forced toward the center of the palm by the ball of the examiner's thumb. The dimpling continues as long as the pressure is maintained.

The first description of this reflex appeared in an English medical journal more than forty years ago. A careful study of this phenomenon seems to indicate that it is not a reflex but an idiomuscular contraction due to diminution of the distance between the origin and insertion of the muscles affected by the manipulation of the pisiform bone.

Reflex Flexion of the Thumb—The examiner manipulates the forearm as for excitation of the hypothenar reflex and presses his thumb on the radial side close to the outer border of the tendon of the flexor of the palm; when the ball of the examiner's thumb, moving with very firm pressure toward the palm, reaches a point one and one-half to two inches from the edge of the palm the thumb may be seen to flex quickly. This seems to be a true reflex; it has not been observed in response to superficial irritation of the skin.

Anent the diagnostic value of alteration of cutaneous reflexes often underestimated, Mueller,[3] citing an unpublished opinion of Struempell, asserts that bilateral absence of the abdominal reflexes is pathognomonic of disseminated cerebrospinal insular sclerosis. This disease in incipiency is a notorious cause of disagreement of diagnosticians. No doubt, when the abdominal reflexes have disappeared under observation, the diagnostic value of their absence is increased. It is well known that unilateral absence of the abdominal reflexes is usual, if not constant, on the paralyzed side in hemiplegia. A double gross cerebral lesion might cause bilateral absence of the abdominal reflexes, but the history and the bilateral gross paralysis would prevent diagnostic error.

If the observations, here recorded, of the reflex response of the brachioradialis to different forms of excitation are valid, a re-examination of the signs of Gordon and Oppenheim[4] seems to be in order. E. Troemner,[5] of Hamburg, records that Gordon's sign was found independently by Redlich and himself, employing a variation of Gordon's[2] manipulation of the calf.*

It may not be superfluous to point out that reflexes, normal and abnormal, vary in themselves and in bilateral relations and associations. It should be kept in mind: (1) Reflexogenous zones vary normally in area; (2) degree of response may vary with variation of intensity of the inciting maneuver; (3) decussation of the cerebrospinal motor tracts varies in degree; (4) relaxation obtainable in the limb examined varies.

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*Manipulation of the thumb in the manner used for the little finger causes reflex responses of all its flexors, but they are less marked than those of the ulnar side.

*Troemner's work does not seem to have had its deserved attention from English and American neurologists.

BOOK NOTICE

A COMPREHENSIVE WORK ON THE NERVOUS SYSTEM

Diseases of the Nervous System, by SMITH ELY JELLIFFE, M.D., Ph.D., and WILLIAM A. WHITE, M.D.; 6th revised edition, 1,175 pages and 497 engravings plus 13 plates; Philadelphia: Lea & Febiger, Inc.: 1935. Price, $9.50.

The diseases and conditions which may visit the nervous system have not by any means been charted and classified, for the simple reason that all of them are not yet recognized or established. The authors, Jelliffe and White, are quick to admit this.

Yet this work by Dr. Jelliffe, who for many years was adjunct professor of diseases of the mind and nervous system at the New York Post-Graduate Medical School and Hospital, and who still is editor of *The Journal of Nervous and Mental Diseases*, is very valuable. He and Dr. White, who is professor of psychiatry in the George Washington University at Washington, D. C., have had access to every important contribution to the field that has occurred since the

5th edition, and their labors demonstrate the advances that have been made. The sections on the vegetative nervous system and on the endocrinopathies are rewritten, the entire text has been thoroughly revised.

It should be stated that the authors approach the study of diseases of the nervous system from the viewpoint of the psychiatrist, rather than that of the anatomist or the neurologic surgeon; but the volume is so comprehensive that all viewpoints are adequately-presented. It is a good job.

GENERAL MEDICINE DURING 1934

The 1935 Yearbook of General Medicine, edited by GEORGE F. DICK, M.D.; LAWRASON BROWN, M.D.; GEORGE R. MINOT, M.D., S.D.; WILLIAM B. CASTLE, M.D., A.M.; WILLIAM D. STROUD, M.D., and GEORGE B. EUSTERMAN, M.D.; first edition, 820 pages plus index, illustrated, black cloth, gold-stamped: Chicago: The Year Book Publishers, Inc.: 1935. Price, $3.00.

This is the first volume of several yearbooks in various branches of medicine which are put forth each year, and its scheme of contents is well-known to every physician who has been in practice for more than a year.

The editors have abstracted five articles from The Journal-Lancet: H. I. Spector's "Bronchopulmonary Fuso-Spirochaetosis" in the September 15, 1934, issue; George C. Turner's "Chronic Passive Congestion of the Lungs, or Cardio-Pneumo-Fibrosis" in the September 15, 1934, issue; J. Arthur Myers' and Ida Levine's "Management of Pulmonary Tuberculosis in the College Age Period" in the August 1, 1934, issue; H. A. Burns' and H. Mark's "Minnesota Plan for the Control of Tuberculosis" in the December 15, 1934, issue; and Ray M. Balyeat's and Everett Seyler's "The Therapeutic Value of the Intratracheal Use of Iodized Oil in Bronchial Asthma" in the September 15, 1934, issue.

As a voluminous collection of abstracts from the most salient points in general medicine during 1934, this *1935 Year Book of General Medicine* is well worth its modest price of $3.00.

ANATOMY AND PHYSIOLOGY OF THE HUMAN FOOT

The Human Foot: Its Evolution, Physiology, and Functional Disorders, by DUDLEY JOY MORTON, M.D.; first edition, heavy cloth, 214 pages plus index, 100 illustrations and plates; New York City: The Columbia University Press: 1935. Price, $3.00.

Dr. Morton, who has long been an outstanding American authority on the human foot, is associate professor of anatomy in the Columbia University College of Physicians and Surgeons. He has given the profession a very valuable work in *The Human Foot,* and he has presented some hypotheses which will warrant investigation.

Professor Morton fires away at two commonly-accepted sources of foot conditions: the inherent weakness of the structural muscles and the existence of an anterior transverse metatarsal arch. Properly speaking, no one but an orthopedic surgeon of long experience should attempt to answer him. It is, of course, bootless to expect much help from a chiropodist.

In the first part, which may be considered the introduction to the main subject, Dr. Morton traces the evolutionary development of the foot and the assumption of man's posture. This particular section is very valuable indeed; the more so because it is made available in compressed form within a single volume which treats of the entire foot.

NUTRITION IN PEDIATRICS

Nutrition Work With Children, by LYDIA J. ROBERTS, Ph.B., M.S., Ph.D.; third edition, dark blue cloth, gold-stamped, 622 pages plus index; Chicago: The University of Chicago Press: 1935. Price $4.00.

Two professors at the University of Minnesota Medical School assisted in the preparation of this book by Lydia Jane Roberts, Ph.D., who is professor of home economics and chairman of the department at the University of Chicago. The two Minnesota commentators were Clarence M. Jackson, M.D., LL.D., professor of anatomy, and Edith Boyd, A.B., M.D., assistant professor of anatomy, both of the medical school.

Professor Roberts has done a very good job of revision in this latest edition of a standard work on pediatrics, which was first published in 1927. Her evaluation of cases appears to be sound, from the evidence which she presents. Her inherent gravity and perspicacity are demonstrated by her statement: "We have not yet reached perfectly firm ground; old methods are being discarded, new ones are being tested; whether or not they will prove satisfactory only the future will show."

This book is too well known to dietitians and pediatricians to be commented upon exhaustively here. It is sound, authoritative, and subdued in tone. It can be recommended.

ANATOMY AND PHYSIOLOGY OF THE HUMAN FOOT

The Human Foot: Its Evolution, Physiology, and Functional Disorders, by DUDLEY JOY MORTON, M.D.; first edition, heavy cloth, 244 pages plus index, 100 illustrations and plates; New York City: The Columbia University Press: 1935. Price, $3.00.

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New Year's Greetings

As a pioneer in the field of medical journalism in the Northwest, THE JOURNAL-LANCET, during its sixty-five years of service, has broadened its scope from a local to a regional, and now to a national publication. It is the official publication of the Medical Associations of North and South Dakota, Montana, the American Student Health Association, and a number of other county and district medical organizations.

It has been a great pleasure for the members of the Editorial Board and the publishers to see on the advertising pages during the last year only advertisements of preparations, etc., of recognized value to the medical profession.

The Editorial Board has put forth considerable effort to select and request such articles as are of greatest service to the readers of the LANCET and to provide space for publication of articles by members of the regular medical profession who are in good standing.

The change with this issue from a bi-monthly to a monthly publication is an attempt to produce an even better journal. In the spirit of helpfulness and good will, THE JOURNAL-LANCET wishes its readers A Happy and Prosperous New Year.

J. A. MYERS, M.D.,
Chairman, Board of Editors.

OUR MEDICAL FUTURE

We have formed the habit of weighing and measuring everything, and so we divide time into days, months and years.

The curtain has been lowered on 1935 and raised on '36. The significance of the change is largely sentimental to be sure, but sentiment adds in no little measure to the pleasures of life.

We are by nature curious about the future, the invisible, the unknown. In youth, we were daisy petal pickers; women fall for fortune telling now at a dollar a throw and adult males, believe it or not, pay good money every year to artists who in cabalistic hieroglyphics foretell the rise and fall of speculative stocks.

Many things will happen in the year before us—that we know. Some will be old and commonplace while others will be strikingly new. No one now living will want to miss the adventure that lies before, least of all the worshipers of Aesculapius. Evolution is progressive. Days and years cause no break in the continuity of that progression and medical progress will continue to be measured by events rather than years. As a profession and as individuals we look forward with eager curiosity. We suspect that medical science will continue in the vanguard. A. E. H.

TOWARD MORE ACCURATE DIAGNOSES

The science of medicine comprises a large field, and the longer we practice, the more are we convinced that medicine is not an exact science.

How often do we have a case in which it appears that a correct diagnosis has been made, with the history, symptoms, and physical signs all pointing to a certain pathology? If the patient recovers, we congratulate ourselves upon our acumen. Should a fatal termination result, however, followed by a conclusive autopsy, we often find, to our astonishment, a different pathology than that which we had expected!

Experience and skilful judgment in interpreting the findings are necessary in obtaining the greatest percentage of correct diagnoses. These errors, however, should not discourage or lessen our enthusiasm in continuing further research and study. For the practicing physician, nothing is better than the weekly hospital meeting. At these staff meetings, cases with their complete history, physical examinations, and autopsy findings, are reported and discussed. Thus, the actual pathology is revealed.

Fortunate is the practitioner who will take the time to attend these meetings and participate in the discussion of these cases. A. K.

THE CHADDOCK REFLEXES

Thirty years ago Dr. Charles Gilbert Chaddock, of St. Louis, made an important contribution to the study of the diagnosis of organic hemiplegia by the publication of his description of what is now known in the text books as Chaddock's Toe Sign, developed by drawing a semicircle with a pointed object around the external malleolus, causing dorsal extension of the big toe. He also described a "wrist sign" which bears his name, in which scratching the ulnar side of the forearm at the junction of the wrist with the palm, with a pointed instrument, produces flexion of the wrist and simultaneous extension and separation of all the fingers. This is also valuable in the diagnosis of organic hemiplegia. The original paper covering the first named is to be found in the Interstate Medical Journal, volume 12, pp. 778-84, 1905, under the title of The Reflex of the Tendo Achillis.

Recently Dr. Chaddock has been making some very interesting observations in the field of physiologic reflexes and the JOURNAL-LANCET feels very fortunate to have secured the publication of his writings concerning this work. They will be found in another part of this issue and are not, we trust, the last contributions of the kind from the pen of this gifted neurologist and writer. His translations of Krafft-Ebing's "Psychopathia Sexualis" and works on Hypnotism and Insanity; of von Schrenck-Notzing's "Suggestive Therapeutics" and his own contributions in Hamilton's System of Legal Medicine, and Peterson's and Haines' Text Book of Legal Medicine and Toxicology are very well known and anything he writes is sure to receive proper attention.

G. C.

SURGEON AND EDUCATOR

Dr. O. J. Hagen, of Moorhead, Minnesota, was elected to the presidency of the Association of Governing Boards of State Universities. This is, indeed, an honor to every member of the American Medical Association. Dr. Hagen graduated from the St. Cloud Teachers' College. At seventeen, he was teaching in a village school; at the age of twenty years he was a college instructor; and at twenty-three was a county superintendent of schools. He later graduated in medicine, following which he took post-graduate work at Harvard University and in Berlin. In practice in Moorhead, Minn., and Fargo, N. D., Dr. Hagen became a very skillful surgeon. In that capacity his services are now sought by large numbers of patients and his counsel by many physicians. In the field of medicine, Dr. Hagen attends the general medical conventions, as well as those of surgery. He has been counselor for the American College of Surgeons, president of the Northern Minnesota Medical Association, and at the present time is a member of the executive committee of the Minnesota Public Health Association.

Throughout his medical work, Dr. Hagen has not lost interest in the educational field. In fact, he was a member of the Board of Education in Moorhead, Minn., for eleven years, seven of which he served as president. For eight years he was resident director of the Moorhead State Teachers' College. For the past five years he has been a member of the Board of Regents of the University of Minnesota. He takes great interest in the Schoolmasters' Club, in Moorhead, and is a frequent attendant at the meetings of the Minnesota Educational Association, as well as the National Education Association.

It is, indeed, gratifying to see a prominent physician not only active in the various phases of medical organization work, but also extending his influence and contributing greatly to general education, thus becoming a national figure on the basis of training, skill, and service in both medicine and education. Not only was his recent election a recognition of past service, but also an expression of confidence in his present ability to serve in an even greater capacity.

J. A. M.

THE DOCTOR AND POLITICS

A political campaign is upon us, and like other citizens, physicians are beginning to think in terms of parties and party principles. This is as it should be, since party government is a unit of the American system.

It is well to remember, however, that party proposals and party policies represent opinions, and not necessarily facts. We are told to lower the tariff, and promote world trade, and restore prosperity. This is *opinion* only. We are also told to raise the tariff, protect American industry and agriculture, and hasten recovery. This, too, is only *opinion*. Then, we are told to restore the gold standard so that confidence will return, business go forward, and unemployment be relieved. Others tell us to devalue gold to adjust debt-paying value to the level on which the debts were contracted. This is supposed to overcome the depression. Both ideas are *opinions* only, and should be treated as such.

What merit these various opinions may have is a matter of controversy. This much I think we all will agree upon. Our political and financial leadership since 1914 has fully justified the statement of that philosopher (I believe it was Bastiat) who once said, "It would stagger humanity if they knew with what little wit the affairs of great nations are conducted."

Let us continue to think politically. Our system of government demands it, but first let us think medically. Our experience has taught us what is wise and what otherwise in matters pertaining to advancement of medicine, the public health and our own welfare. My plea is not that we cease to think politically, but that we make it our first concern to know what those who seek our support intend to do about our problems. Perhaps it is wise not to pay too much attention to the ballyhoo of men seeking political jobs. We should not permit our ears to be dulled to the voices raised against us by the blaring of political trumpets.

A. S. R.

CHICAGO PASSES A FRACTURE ORDINANCE

The medical profession and the laity are quite familiar with the necessity and value of laws and ordinances as public health measures for the prevention of diseases. They are also familiar with laws for the prevention of accidents. Chicago has recently passed the following ordinance for the prevention of further damage to an injured person after an accident has occurred:

AN ORDINANCE

Amending Article VI (ambulances) of Chapter 45 of the Revised Chicago Code of 1931 and providing for the equipment of ambulances with first aid and splint appliances.

Be it Ordained by the City Council of the City of Chicago:

Section 1. That article VI of chapter 45 of the Revised Chicago Code of 1931 be and the same is hereby amended by inserting, between sections 2343 and 2344 thereof, a new section to be known as section 2343-a, which new section shall read as follows:

> 2343-a. Attendant—splints required. No person, firm or corporation shall operate or cause to be operated any ambulance, public or private, or any other vehicle commonly used for the transportation or conveyance of the sick or injured, without having such vehicle equipped with a set of simple first aid and splint appliances approved by the board of health and having in attendance at all times such vehicle is in use a person who has obtained a cer-

tificate of fitness as an ambulance attendant from the board of health.

Any person desiring a certificate as an ambulance attendant shall make application in writing therefor to the board of health. Before the issuance of any such certificate the applicant therefore must present evidence of his qualifications to fill such position and must demonstrate to the satisfaction of the board of health his ability to render emergency first aid and to apply approved splints to arm and leg fractures.

Section 2. This ordinance shall take effect and be in force from and after its passage and due publication.

The Chicago Tribune in commenting on this ordinance in its issue of November 5, 1935 says: By bundling a traffic victim into the first available automobile and rushing him off to a hospital without adequate first aid care, the good Samaritan oftens does more harm than good. Serious harm is often done by the kindhearted passing motorist who picks up the victim, doubles him up to get him through the narrow door of his car, twisting the dangling broken leg or arm and increasing the peril to the unfortunate victim.

This ordinance is one which might very properly be shown to our city officials with the hope that it may be adopted by all cities for the benefit of all who may receive fractures. Who knows who the next victim will be?

R. C. W.

FACT VERSUS OPINION

One of the chief differences between philosophy and science is that the individual philosopher always starts from the beginning, whereas, the individual scientist accepts what has been well done in the past and starts where his predecessors left off. This permits a gradual accumulation of scientific knowledge.

However, when new facts have been established in medicine by actual research, there has always been a group who for one reason or another have attempted to use contrary opinion to break down the results of research. Not infrequently, unable to succeed lone-handed, they resort to the questionaire method; that is, a questionaire is prepared on the subject and sent to individuals, who like themselves have done no actual work but who cling to the same opinion. When these questionnaires are accumulated, the expressions of opinion are considered as overwhelming evidence against the facts recently established by research. In reality, they are merely a statistical compilation of the prevailing opinion.

The scientific and honest method of approach consists of attacking the problem in question by standard methods to determine whether the previous findings can be confirmed. Even such confirmation may be useless duplication if the original observations have been made upon a sufficiently large volume of material by men with a true scientific attitude and training. How futile it was for Harvey's opponents, whose opinions were unsupported by actual research or observation, to attempt to overthrow his highly scientific work and his well-established facts. Although their numbers handicapped his investigation and greatly delayed the acceptance of his work, the fact remains that eventually each of them has been forever forgotten, while the name of Harvey will be honored as long as science lasts.

The question arises as to why all progress has been met by such bitter opposition. In a small volume entitled, "Social Factors in Medical Progress," by Stern, published by the Columbia University Press, there are some illuminating instances discussed.

Some may argue that opposition to progress insures confirmation of work. To a certain extent this is true but, unfortunately, the opposition has frequently become so bitter as to actually have driven workers from the field and the world is now much poorer for their having been unable to complete their investigations. Semmelweis is a classic example of this situation. In many instances unwarranted opposition, based wholly upon opinion, has greatly delayed new information from reaching the channels where it could be employed in the prevention of suffering and the saving of lives.

We often think of such opposition to medical progress in connection with old discoveries and, therefore, only of historic interest; in reality, it is in effect at the present time. Certainly we have not forgotten the opposition to Banting's discovery of insulin.

J. A. M.

SOCIETIES

PROCEEDINGS
MINNESOTA ACADEMY OF MEDICINE

Meeting of November 13, 1935

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, on Wednesday evening, November 13th, 1935. The president, Dr. A. R. Hall, called the meeting to order at 8 p. m. There were 60 members and one visitor present.

Minutes of the October meeting were read and approved.

Upon ballot the following men were elected as candidates for membership: Dr. W. L. Benedict, Rochester, to associate membership; Dr. L. M. Daniel, Minneapolis, to active membership, and Dr. Robert G. Green, Minneapolis, to university membership.

The scientific program followed.

RADIATION THERAPY

R. G. Allison, M.D.

MINNEAPOLIS, MINN.

Dr. Allison read his Inaugural Thesis on the above subject and showed lantern slides.

Abstract

The history of radiation therapy was reviewed from the time of Roentgen's discovery of the ray up to the present time. The gradual evolution of the different measuring instruments was described. The development of the interrupterless transformer and the hot cathode tube was described. The combined radium-x-ray therapy was described. Comparative values of radiation at 200 kilo volts and 400 kilo volts and radium therapy were cited. The sensitivity of different types of tumors to radiation was discussed.

Discussion

Dr. R. T. LaVake (Minneapolis): Last year we had two cases of advanced carcinoma of the cervix and corpus uteri. One of these women in November of the year before came in with slight bleeding ten years after the menopause. She was told she must have a diagnostic curettage but she was going to Florida and said she would have it done there if necessary. After going to Florida she bled a little and the physician did not do a diagnostic curettage but gave her deep x-ray therapy (I do not know the strength) and she stopped bleeding. She came back in May and was apparently normal. About September she was brought in with a huge tumor that came up to the umbilicus. It gave the impression of being an ovarian cyst. A preliminary diagnostic curettage was performed. On going through a small senile cervix, a quart of bloody fluid came from the uterus and when the cervix was dilated a carcinoma was found which extended from the fundus of the uterus to and involving the cervix. It looked absolutely hopeless. Knowing that Dr. Schmitz had this 800 kilo volt machine, we sent her down to Chicago. That was last November and when I examined her two weeks ago I could not feel the least bit of pathology. Apparently she is cured. Time alone will tell.

The other woman presented in extremis, but we decided to try the 800 kilo volt machine. So she was sent to Dr. Schmitz. She was almost moribund and we did not know whether she would live to get there. She had two courses of treatment and was well for about five months. Then she developed metastases and died in four months.

* * *

SCHLATTER'S DISEASE

L. C. Bacon, M.D.

ST. PAUL, MINN.

The treatment of three cases of Schlatter's disease or, as sometimes designated, Schlatter's syndrome, during a period of one year has caused me to view the difficulty with interest and to come to the conclusion that it is not as rare as the meager mention in textbooks would lead one to believe. In a rather extensive search of the surgical works in the English language, I find that reference to the condition is contained in a short paragraph or two or it is not mentioned. One surgeon of prominence devotes a short paragraph to the condition and states that he has seen such a case.

It is a difficulty of the adolescent period of life and in our cases occurred in high school athletes. The inference is that it may occur in the adolescent whenever the individual is subjected to a sudden and unprepared-for strain, especially in contests. Since seeing these cases, I have taken the opportunity, when possible, to examine the tuberosity of the tibiae in those with a history of youthful athletics and have been interested by the number who show an unusual prominence of the tuberosities. It seems probable that Schlatter's disease is more frequent than is supposed and that it is often overlooked.

Our cases gave a history of a sharp pain below the knee occurring during violent exercise, followed by continued pain and an inability to hold the leg stiff and to control the knee when standing. Grasping the tuberosities firmly between the thumb and fingers, they have been distinctly movable.

I have searched out the original discussion of the condition by Dr. Carl Schlatter, of Zurich, published in 1903, but have been unable to find a translation into English and it seems fitting that a translation should be here given. For this translation, I am indebted to the kindness of Dr. Johann J. Hochfilzer, of St. Paul. The discursive part of the original article follows, leaving out only the report of some eight cases.

TRANSLATION

"Injuries of the Beak-like Process of the Upper Tibiae Epiphyses"

Dr. Carl Schlatter

"There is a typical form of a not very rare knee injury but its clinical entity has not been fully described so far, in spite of the remarkable progress made in clinical diagnosis in the modern age. At least I was unable to find any references in the medical literature.

"In such injuries a piece of bone is chipped off from the process of the upper tibial epiphysis, which embraces anteriorly, beak-like, the caput tibiae.

"Among our large clinical material we see from time to time young patients who complain about pains in the knee region which they believe might have been caused quite some time ago either by trauma or spontaneously; physical findings in such cases are usually essentially negative except a tenderness over the tuberosities of the tibiae; and so many times a wrong diagnosis has been made, calling this condition incipient tuberculosis of the tibial epiphysis or an inflammation of the infra-patellar bursa if a slight swelling in the region of the ligamentum patellae accompanies the tenderness; but such a diagnosis becomes very doubtful after the patient has fully recovered in spite of no, or very irrational, treatment instituted for such conditions. Seven cases of this kind came under my observation in the last two or three years which were for a long time sailing under a wrong diagnosis. I succeeded finally in making a correct diagnosis in these cases. It was made possible through the co-operation of the x-ray institute of the Canton Hospital in Zurich, whose chief is Dr. Zuppinger.

"The following-up and study of these cases has finally convinced me that we are dealing with a very characteristic clinical entity and its symptoms can be interpreted quite easily even without x-ray pictures. (Then follows the report of eight cases.)

"First of all a few anatomical remarks which may illuminate the occurrence and etiology of these injuries. For the understanding of such cases it is of paramount importance to have an exact knowledge of the nature and development of the upper tibial epiphysis.

"The best textbooks of anatomy describe this condition very insufficiently and mostly in small print. It is said that, in adolescence, a tongue-like process develops at the proximal epiphysis from where the tuberosities of the tibiae come off, but nothing is said about the very important question, in what year of development does this process appear and when does it disappear, that is, when does it unite with the diaphysis; also whether it originates from the epiphyseal plate or from a separate bone nucleus, or, in other words, whether it grows from above downward, or vice versa? According to Langer-Toldt, the development of the epiphyseal process occurs in the period from the 11th to the 13th year, and disappears in the 19th year of life. According to Merkel-Heub, the unification between the epiphysis and the bone shaft takes place between the 18th and 25th years of life. Wilms and Sick studied the development of the bones on hand of numerous x-ray pictures from birth to full growth. They found, in the 13th year of age, the appearance of a beak-like process at the upper tibial epiphysis which later forms the tuberosity of the tibia. According to their observations the epiphysis united with the diaphysis in the 20th year of age. Ludloff has lately written about the architecture of the lower epiphysis of the femur and upper end of the tibia. He states that a new seam of the epiphysis appears in the 12th year of life, which branches off from the cross seam of the tibial epiphysis. In the seventh and eighth years of life this incipient stage of bone formation is hardly noticeable, but from then on it grows rapidly to a noticeable tuberosity in the 15th year of age and can not be distinguished from the diaphysis at the end of the 18th year of age.

"These classifications are of great importance in keeping before us the possibility of the occurrence of these injuries. I tried to substantiate the accuracy of these statements on a large amount of material at the institute of anatomy at Zurich. These investigations proved that the time of the appearance and disappearance of the epiphyseal process is very variable. In one case a fully developed process could be made out at the age of 12; in another it could not be detected at the age of 15. It further proved that the unification of epiphysis and diaphysis may take place in some cases as early as the age of 14, while the usual time is between the 18th and 20th years. From our x-ray pictures we formed the impression that not only general development and constitution but also the race of the individual had a great influence on the growth of the epiphysis. For instance, we find an earlier differentiation of the epiphysis in the Roman race than in the Germanic.

"On close observation of our anatomical material and x-ray pictures we find, without exception, a bone nucleus at the distal point of the tongue-like process; this nucleus always has some connection with the process either through porous fragile bone substance or a small cartilaginous bridge, according to the age of the individual. Therefore, it is our belief that in the great majority of cases the epiphyseal process arises from the bone nucleus of the tuberosity of the tibia by a growing together of the nucleus and the epiphyseal plate. This point of conjunction leaves an area of diminished resistance where even slight injuries may cause a separation of the continuity. There we have, in the earlier years of life, a thin cartilaginous and later a fragile spongy bone (Snange) in the same area that the ligamentum patella is inserted and it is easily conceivable that, besides direct fractures, indirect fractures may occur through a forceful contraction of the quadriceps muscle. It is peculiar that in many cases of our material, the patient denied any kind of trauma though the x-ray pictures gave definite proof of an injury to the epiphyseal process.

"A survey of our material relative to the pathological anatomical changes brings out the fact that the point of the epiphyseal process where the bone nucleus is located is usually the seat of the injury. We find this portion either in a state of dislocation or, later on, thickened by the formation of callus. During the developing stage of the process only its point seems to be subjected to injuries because the weak cartilaginous bridge is unable to transfer the force. In one macerated bone of a juvenile individual, I saw the formation of a fracture line just because of the process of maceration, but in the later stage of development, where the epiphyseal process is already united with the diaphysis, a dislocation of the whole beak-like process may take place. The ages of our patients were between the 12th and 17th years. Individuals between 13 and 14 years of age seem to be especially disposed to this injury.

"Very peculiar was our observation that all cases were males and that the injury occurred seven times on the right knee and only once in the left. The reason for the rare occurrence among females may be the difference in their occupations and the less strenuous use of their muscles. I do not believe the fact that the right knee is so often involved is just accidental. There are certain reasons for this predisposition of the right side. Daily experience shows us that the right leg is much more used than the left and, therefore, the musculature of the right extremity is better developed than the left one. The right extremity is, therefore, more often exposed to various insults and its strong quadriceps muscle may easily cause a tear of the ligamentum patella from its insertion and so lead to an indirect fracture.

"Now in regard to the symptoms of these injuries. The subjective symptoms have something very characteristic. We are usually dealing with male patients in the period from the 12th to the 20th years, but especially in the 13th and 14th years of age. Going into their history we find that their symptoms, chiefly pain in the knee region, were caused either by a direct fall on the knee or by a forceful pull of the quadriceps muscle. These pains may be very light in the beginning so that the patient may have forgotten what caused them. In uncomplicated injuries of this kind the functional disturbances are very slight, and maximum flexion and extension are possible. Only in cases where the extremities are used a great deal the pains may exacerbate. Frequent recurrences of these increased pains may finally bring the patient to the physician although the injury may have occurred many months in the past.

"Among the objective symptoms, the most characteristic is tenderness on pressure over the epiphyseal process. The typical tender spot lies over the tuberosity of the tibia about two and a half centimeters below the knee joint. The region of tenderness can be covered with the end of your thumb. Besides this tenderness, one usually finds, on the same spot, a bony protuberance. If the patients are examined in the later stage of their morbidity, these two symptoms only are markedly pronounced. If the injury is a recent one, one finds also a swelling of doughy consistency in the patellar region. The knee joint itself is usually free from symptoms if the injury is uncomplicated and so extra-capsular. Another symptom which should be mentioned is the muscular atrophy, especially of the quadriceps muscle, because of the inactivity of the lower extremity.

"The prognosis of this condition is favorable. We are dealing with an affection which is part of a physiological development of the bone and which disappears as soon as a bony union between epiphysis and diaphysis has taken place. Therefore, time itself may bring complete recovery without any medical intervention. The closer the patient is to the end of the developing period, the sooner will the morbidity cease; therefore, the prognosis is more favorable in older individuals than in younger ones. Involvement of the knee joint has a great influence in determining the time of recovery.

"Of great importance is an early rational treatment. These cases without treatment suffer pains over a period of a year or more, while the treated cases were much sooner relieved of their pains, some even after a few weeks. In spite of the long period of morbidity, no permanent disability results from it. Sometimes the formation of marked callus at the tuberosity of the tibia may develop, which hinders long kneeling on the knee. The principle of a rational treatment for these cases is immobilization of the knee joint. If the injury is of slight degree application of an immobilizing bandage is sufficient. Severe cases demand rest in bed that will also help to prevent further action of the quadriceps muscle on the plane of fracture. Starch bandages are better than splints. It is advisable to start with massage of the quadriceps muscle quite early to prevent an otherwise inevitable muscular atrophy."

This ends the translation of Dr. Schlatter's article, and the most that can be said about these cases has been discussed therein; but in our cases we noted a few variations.

In all three of our cases the tuberosities of both tibiae were fractured. In all three cases the onset of the difficulty was marked by a sharp pain followed by continuous pain and inability to control the knee. The patients said the knees became weak at once and continued weak. The trouble began during strenuous exercise and had existed only a few days when we were consulted. The pain and swelling were confined to the area of the tuberosities and these were prominent and distinctly movable when firmly grasped between the thumb and finger.

The first case was in a large and finely developed boy, age 15 years, who played center on one of our high school football teams. The pain and disability came on during a scrimmage. He had completely lost the ability to extend the legs and to control them when standing. As you can see in the x-ray negative, the insertion of the patellar tendons with a portion of the tuberosities had been torn away and a dislocation of the remainder of the tuberosities had occurred.

The second case was that of a 15-year-old boy whose specialty was pole vaulting. The detachment was not as complete as in the first case but was of the lower portion of the tuberosities with fracture through the process, and the disability was not as great as in the first case.

The third case was that of a 10-year-old girl given to doing cart-wheels. Both tuberosities were displaced and the general symptoms were the same as in the other cases. This case showed exceptions to several of Schlatter's observations, namely, a girl, and younger in age. The fact that she was athletic makes it probable that the difficulty may occur in either sex if the properly directed strain occurs. As you will see in the negatives, the rupture is marked in the first view; in the second, taken after four weeks, the position is good and the line of cleavage is still apparent. The third plate, taken nearly a year later, shows the final results. The left still shows the line of cleavage with some bone formation making a firm union. The right seems to be united by bony formation. The child has just reached her 11th year.

We saw all of these cases within a few days of the accidents and the symptoms were acute and apparent. Rest, posterior splints and strapping with adhesive, corrected the symptoms in a few weeks, with a restoration of function. In all cases the tuberosities remained prominent.

Discussion

Dr. A. R. Colvin (St. Paul): The changing opinion relative to the etiology of bone disease is interesting to follow. It is but a short time since there was a great deal of speculation as to the origin of von Recklinghausen's disease or generalized osteitis fibrosa; and then out of the researches on parathyroid disorder and calcium regulation comes the recognition of the relationship of parathyroid tumors to hyperparathyroidism and the relation of this to decalcification of bones and to osteitis fibrosa. Removal of the parathyroid tumor results in complete calcification of the bones again.

In 1903 Schlatter described a traumatic separating of the epiphysis of the tibial tubercle. Osgood described it in 1904, and in 1906 Schlatter again described partial separation of the tubercle. In 1917 and since there seems to be a tendency to include Osgood-Schlatter's disease in the same category as Perthes, Calvé, Legg disease of the hip in the young and it is now designated as Osteochondritis Deformans Juvenilis. This disease process seems to begin in the bone underlying the epiphyseal cartilage with a resulting separation of the epiphysis due to trauma or not, for there often is no history of trauma. Osteochondritis dissecans used to be ascribed to trauma, and here again we have an underlying circumscribed osteitis with resulting fracture of the cartilage and the letting free of a loose body in the joint.

The two slides I have are shown to indicate the importance of differential diagnosis in the region of the tibial tubercle. The first slide shows a localized granulating osteitis in the region underlying the tubercle: from the granulation tissue cultures of staphylococci were found. In the slide it looks as if the tubercle had been separated.

In the next slide, a small area about the size of a grain of wheat is seen on the superficial surface of the tubercle from which again cultures of staphylococci were made. These slides are shown, not to connect them with Schlatter's disease, but to call attention to the diagnostic possibilities. Perthes, Calvé, Legg disease, Schlatter's disease, Kohler's disease, are also spoken of as an osteochondritic dystrophy.

Dr. Arnold Schwyzer (St. Paul): This paper brings back memories of student days. Schlatter and I were students together and were for a short time together as assistants of Kroenlein in Zurich. Schlatter, in Kroenlein's absence, made the first successful total gastrectomy. When he later came out with his observations on what he termed avulsion of the tuberculum tibiae he considered the condition due exclusively to trauma. However, right from the start this explanation did not satisfy others. Roentgenologists showed that what he had taken for an avulsion of the tubercle could be seen rather regularly in adolescents, particularly in late rickets. It was then shown that quite often trauma had not preceded, and that in some cases the trouble was bilateral.

The tuberculum has a separate center of ossification but is connected with the cartilaginous line of growth by hyalin cartilage. Thus the slender shadow appears torn away from the tuberosity, but in reality is connected by cartilage. Nevertheless, Schlatter has called attention to a well localized disturbance which at times is due to trauma. It was later found that the great majority of the cases with this localized pain, swelling and an abnormal x-ray finding of the tuberculum, are occurring on the soil of late rickets. I remember a bilateral apophysitis of this kind where positively no trauma had preceded as far as the intelligent patient could remember. There was a well localized swelling and pain and the typical x-ray finding. No further treatment was necessary beyond abstaining from harsh exercise.

As all apophyses grow by endochondral ossification, disturbances in the deposition of lime salts will occur. These disturbances are not as great as on the ends of the diaphyses (the metaphyses) because the growing activity is, of course, much less in the former. Nevertheless, disturbances do occur often because the bones near the joints are more superficial and more exposed to trauma. Irregularities in the ossification of the tibial tubercle are of numerous shapes and the exposed location easily leads to mild forms of inflammation.

Dr. C. C. Chatterton (St. Paul): We see a great many cases of painful knees in children along about "marble time," that is, when boys and girls are playing marbles on frozen ground or cement walks, and very often if an x-ray picture is taken we find that the tuberosity of the tibia is apparently loose, often in many pieces or fragmented. These cases primarily recover by simple supportive treatment with a bandage and pad over the knee. We very frequently find a similar condition, as far as the x-ray is concerned, in normal individuals. When the tuberosity of the tibia becomes infected, it certainly demands more than the usual protective treatment and practically always an operation is necessary to remove any dead bone or curette the granular area between the tuberosity and the shaft of the bone, removing the area of infection and allowing the tuberosity to become united with the shaft of the tibia.

Dr. Bacon (in closing): I want to thank the gentlemen for their discussion. It has been very interesting to me.

The problem that came to my mind was that while my cases were distinctly traumatic and healed very promptly with rational treatment, I wondered why they sustained separation of both tuberosities instead of only one as described by Schlatter. It seems to me there must have been some nutritional deficiency, as suggested by Dr. Colvin.

I have been particularly interested, since seeing these cases, in examining the tuberosities of the tibiae in high school athletes, and to note the frequency with which sharply prominent tuberosities appeared. To me this would indicate that there had been some injury sustained.

Dr. John Brown (St. Paul) reported a dermatological case following injury.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

MINNESOTA STATE SANATORIUM CLINICS

As an introduction to the practice of holding clinics at the Minnesota State Sanatorium once each month for the benefit of the members of the medical profession located near the institution, Dr. H. A. Burns, Superintendent of the Sanatorium, made the following remarks:

The diversity of clinical material coming into the Minnesota State Sanatorium is both interesting and extensive. This occurrence has become so marked that we have felt it an opportunity as well as an obligation to present cases to the doctors in the neighborhood and visitors at a distance. We trust that our conclusions are well-founded and that the material to be shown in this and succeeding clinics will be remembered with both profit and pleasure. We would be very happy to have suggestions from the visiting doctors relative to the clinical problems in which they are particularly interested, and to include such requests in our programs from time to time.

The clinical work being done at the Minnesota State Sanatorium is comparable with the work in any general hospital of similar size. Every effort is made to study completely each case upon admission, to study constantly each case while in residence, and to investigate all symptoms whether associated with tuberculosis or due to non-tuberculous pathology developing during the course of hospital residence. This gives the Sanatorium an aggressive, curious and altogether efficient clinical staff which is not at all reticent in the matter of presenting its interesting and frequently challenging clinical material to the profession.

Dr. Wilson has a faculty of choosing paradoxes and for that reason he has very well chosen for his clinic this evening:

PULMONARY TUBERCULOSIS AND BRONCHIECTASIS: THEIR DIFFERENTIAL DIAGNOSIS*

Viktor O. Wilson, M.D.
Minnesota State Sanatorium
Ah-Gwah-Ching, Minn.

This first case is that of a 26-year-old white woman, who is married and the mother of five children. She has been sick since July, 1935, with pain in the chest, cough and expectoration, fever, and gradual loss of weight, which has reached 15 pounds. The cough and expectoration are marked symptoms. On October tenth her sputum was blood-streaked. Her past history includes measles, mumps and chicken pox. A tonsillectomy was performed in 1917, and appendectomy in 1929. There is no history of pertussis, influenza, pneumonia, or repeated respiratory infections. This patient's twin sister has suffered from pulmonary tuberculosis the past three years. The patient has also been closely associated with a lady friend who has tuberculosis of the lungs.

On physical examination the patient is found to be undernourished. She shows evidence of moderate anemia in that her conjunctivae and mucous membranes are definitely pale. Inspection of the chest shows definite lagging of the left side on inspiration. This is accompanied by slight suppression of breath sounds and a few moderately coarse rales at the left base. The right hemithorax and heart are negative to physical examination. There is an old right rectus abdominal operative scar.

This patient reacted postively to the Mantoux tuberculin test. Sputum examinations revealed the presence of tubercle bacilli on four occasions. Her hemoglobin was 64 per cent and red blood cell count was 3,400,000 per cubic mm. The blood sedimentation rate shows a vertical curve. Urine and Wassermann tests were negative. Her x-ray examination demonstrated a parenchymal mottling of the left base from the fifth rib downward. (See Figure 1.)

Comment—This case presents an interesting diagnostic problem. The chest x-ray shows a lesion characteristic of a lower lobe bronchiectasis. There is marked cough and expectoration, though we have noticed these symptoms to be likewise prominent in basal tuberculosis. Hemoptysis is also present and is more characteristic of bronchiectasis than of tuberculosis. Vinson found pulmonary hemorrhage present in 49 out of 100 cases of bronchiectasis, whereas in 100 cases of active pulmonary tuberculosis only 29 gave histories of hemorrhage. The physical findings of slight suppression of breath sounds and a few medium coarse rales at the base of the left lung are consistent with a diagnosis of bronchiectasis.

A primarily basal pulmonary tuberculosis is a comparatively rare disease. Among our 355 patients we have only one other case whose tuberculosis is entirely located at the base of the lung. The National Tuberculosis Association standards for diagnosis of tuberculosis, 9th edition, published in 1931, includes seven criteria as

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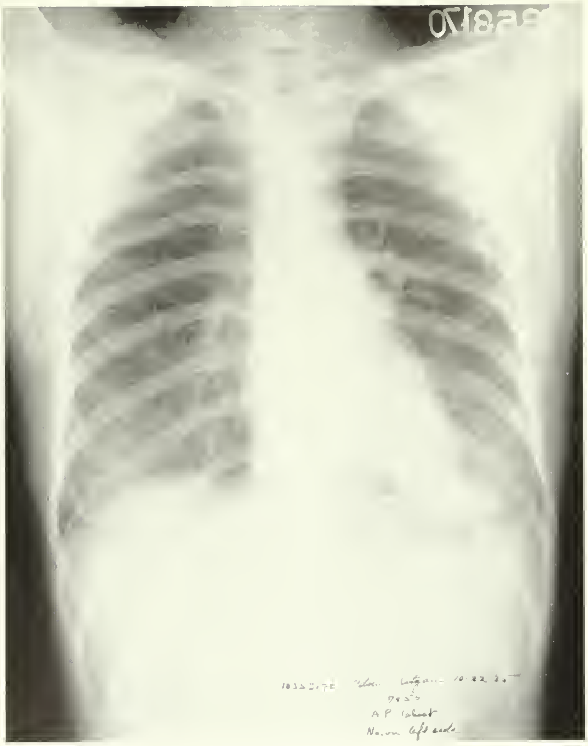
*Paper discussed by J. A. Thabes, Brainerd; L. L. Culp, Minneapolis; Z. E. House, Cass Lake; R. W. Campbell, Cass Lake.



CASE I
X-ray of chest showing mottling at left base. Lipiodol instillation of this diseased area failed to reveal any bronchiectatic cavities.

follows: (1) history; (2) symptoms; (3) physical findings; (4) chest x-ray findings; (5) laboratory findings; (6) tuberculin reaction, and (7) exclusion of other diseases.

An analysis of this patient's history shows definite exposure to tuberculosis and a definite toxemia as evidenced by fever and loss of weight. A toxemia is not usual in early bronchiectasis. On examination the patient has a positive Mantoux tuberculin reaction. It is only a few years ago that the medical profession believed and taught that every young adult was infected with tuberculosis. The value of the tuberculin test was, therefore, discredited. Recent tuberculin testing has been done in colleges and universities and in 1933 it was found that 35 per cent of 14,318 students reacted positively. At the University of Minnesota, Dr. J. A. Myers has shown that 33.4 per cent of the students reacted positively to the tuberculin test in 1928. Since that time the number of reactors has fallen to 24.9 per cent in 1932. The case now under discussion is very little over college age and the Mantoux tuberculin test is, therefore, not only significant in her present illness, but is yearly becoming of increased diagnostic value in her age group.

The physical findings and chest x-ray film indicate a left basal pulmonary disease. They are more characteristic of bronchiectasis than of tuberculosis. But this patient has a repeatedly positive sputum. The history of exposure to tuberculosis indicates the necessity of a tuberculin test. This being positive and the finding of tubercle bacilli in the sputum definitely identify this case as one of pulmonary tuberculosis. In addition we can then exclude the presence of bronchiectasis by lipiodol instillation of the left bronchial tree. This examination was made and failed to show any evidence of bronchiectatic dilatations or sacculations. This case could appear to be one of bronchiectasis but actually is one of left basal pulmonary tuberculosis.

This second case is that of a 21-year-old, single, white woman whose present illness dates back to 1922, when, at the age of eight years, she had pneumonia complicated by empyema and "heart trouble." She was in bed with this illness for three years but finally recovered. Tonsillectomy was done in 1925. During the next three years the patient enjoyed good health except for a persistent cough which had remained since her pneumonia. She went to school and participated in the school athletics and other school activities.

In 1928, at the age of 14 years, she noticed increased cough and became weak and easily fatigued. One year later she became acutely ill with high fever, up to 103 or 104 degrees. This fever persisted for four months and she developed profuse expectoration of a thick, greenish, foul-smelling sputum. The diagnosis was tuberculosis and she was put to bed for rest therapy.

Since that time there has been little change in her condition. She has remained constantly in bed with febrile periods, cough and profuse expectoration. The course of her disease has been marked by two periods of pulmonary hemorrhage; the first was in 1931 when she coughed up 750 c.c. of blood over a six-day period; the second of 500 c.c. occurred in 1934 over a three-day period.

There is no history of exposure to tuberculosis in this case. This patient's mother, brothers and sisters are not sensitive to tuberculin and have negative chest x-ray plates. The father has a chronic cough which was never attributed to tuberculosis, although he was never x-rayed.

The positive findings on physical examination are a fairly good state of development and nutrition. The patient is pale and weak. The teeth are in poor condition, there being extensive caries, extractions and malocclusions. The heart appears to be moved into the left chest, for the apex beat is three centimeters left of the nipple line and the right border is substernal. There are no other abnormalities of the heart. Percussion of the left cardiac border was impossible because of marked dullness or flatness throughout the left chest. The left hemithorax appears smaller than the right and respiratory movement is markedly restricted. The infraclavicular fossa is noticeably deepened. On auscultation breath sounds are markedly suppressed or absent throughout and a few medium and coarse rales are heard after cough. Increased fremitus is palpated. The right hemithorax is negative. There is a slight left spinal scoliosis. Watch crystal finger nails and clubbed fingers are present.

The Mantoux tuberculin test is negative to all concentrations up to 1/100. Many sputum examinations are negative both on direct smear and hydrocarbon-

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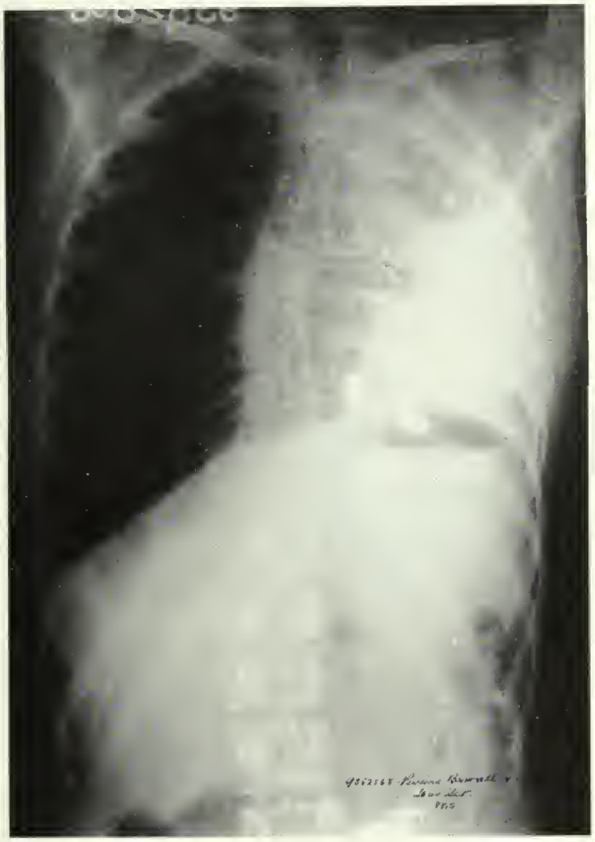
flotation test. Guinea pigs were inoculated and when examined after six weeks no evidence of tuberculosis was found. The sputum is very foul, greenish in color, occurs in amounts up to seven or eight ounces daily, and separates into three layers characteristic of bronchiectasis. Hemoglobin is 77 per cent; erythrocyte count is 4,300,000 and the white blood cell count 14,800, of which 65 per cent were polymorphonuclear leucocytes and 35 per cent lymphocytes. The blood sedimentation test presents a diagonal curve. Urine and Wassermann examinations were negative. X-ray films of the chest show the left hemithorax completely blotted out by a dense shadow. The heart and mediastinum are markedly pulled into the left chest. All one can say is that there is definitely extensive disease of the left lung with massive atelectasis.



CASE II
X-ray of chest. Massive atelectasis of left lung with lipiodol instillation, showing extensive bronchiectatic cavities.

Comment—The history of years of illness with cough and expectoration and disability strongly suggests a diagnosis of tuberculosis. The x-ray picture is certainly typical of an extensive tuberculosis with massive atelectasis involving the left lung. We have at least six cases of tuberculosis in the sanatorium with similar x-ray pictures. However, these patients all have markedly positive sputum and positive tuberculin tests. They are cases of extensive tuberculosis and massive atelectasis involving one lung.

This patient's illness dates from pneumonia complicated by empyema and she has coughed ever since. Her sputum is the typical, very copious, foul, three-layered, greenish sputum. These facts, coupled with repeatedly negative tuberculin tests and unsuccessful search for tubercle bacilli, make the diagnosis clear. In addition we have conclusive evidence of lipiodol-filled sacculations and dilatations of the bronchi.

The treatment of this case also presents an interesting but rather awesome problem. All will concede that she has a serious, disabling, life-long disease. Such simple measures as postural drainage, iodides, sedatives, rest in bed, wholesome diet, and fresh air are indicated to give symptomatic relief, prevent the further development of the disease process, and maintain a good general state of health. Obviously, these simple measures will not materially improve the gloomy outlook, and any curative treatment will have to be radical.

Of the available less radical procedures, simple surgical drainage, as employed in a solitary lung abscess, and Graham's cautery pneumonectomy, are not applicable because of the extensive and numerous abscess pockets. Pneumothorax collapse therapy is a relatively safe procedure and has proved of considerable value in early and limited cases of bronchiectasis. However, pneumothorax is unlikely to aid this case because of strong, fibrous-walled cavities that could not be collapsed by the amount of pressure that can be obtained.

Apparently this case of bronchiectasis is amenable only to such formidable procedures as extrapleural thoracoplasty and total pneumonectomy. The latter is a very dangerous operation. Dr. Myers, in his new book on chest diseases, mentions only three cases that have survived the removal of one entire lung.

On the other hand, extrapleural thoracoplasty is not wholly satisfactory because the collapse obtained often is not sufficient to control the disease. It is, however, the least dangerous to life, and, if it does not suffice, the way is still open to further surgical procedures. It would seem that a multiple stage thoracoplasty offers some hope for this young woman.

Summary—In summary I might say that the first case appears to be bronchiectasis but actually is a case of basal tuberculosis. The second case looks like tuberculosis and found its way to a sanatorium, but actually is one of extensive unilateral bronchiectasis. Lipiodol installation of the bronchial tree proved an important diagnostic aid. Dr. Burns has selected these two cases for this clinic not only because they present interesting problems of diagnosis, but because they admirably illustrate the importance of routine tuberculin testing and sputum examinations in the diagnosis of lung diseases.

* * *

Dr. Burns: Dr. Simons will present his part of the program at this time.

MULTIPLE TUBERCULOUS LESIONS IN THE SAME PATIENT*

Edwin J. Simons, M.D.
Minnesota State Sanatorium
AH-GWAH-CHING, MINN.

This case is being presented, at Doctor Burns' suggestion, because it demonstrates tuberculosis of four different organs in the same individual. Its novelty is due to the fact that the organs involved are unrelated and, relatively speaking, anatomically distant from one another. Such coincident pathology emphasizes the relationship of tuberculosis of one organ to that of another and requires a discussion of the prognostic significance of the various lesions.

It is the case of a white male, 43 years of age, who presents the following history: His present illness began with hoarseness one month after a tonsillectomy in 1921. After eight months of varying intensity and duration of hoarseness, a physician told him it was due to tuberculosis. During this same year he had an eczematoid eruption on the inner portion of his left foot. Later in 1921, he developed a large sore on the right side of his face, a smaller one on the left cheek, one on the back of his neck and one about the size of a quarter on the inner portion of his left thigh. These sores gradually increased in size, but did not, with the exception of the one on his foot, due to chafing, cause pain or discomfort.

He went to various doctors and used different salves and medicines without healing the sores. About three years ago he went to a dermatologist in another state who told him his skin trouble was "blastomycosis." The patient states that he then was subjected to x-ray or electrical treatments without beneficial results. In February, 1935, he saw Doctor Michelson, who instituted some kind of lamp treatment after which the sores healed and have remained healed.

After a change of climate for eight months in 1921, his hoarseness disappeared entirely for two years. Since then he has tried every form of treatment for hoarseness, yet it has grown intermittently worse. For the past several years it has been better, but just prior to his hospital admittance it again has been worse.

In the summer of 1934, following x-ray treatment of his skin lesions, he gradually became short of breath. In February, 1935, he caught cold and began to cough and expectorate. These symptoms grew worse, and, in May, he developed a pain in the left side of his chest, which was aggravated by deep breathing. He began to have an afternoon flush and fever. At about the same time he started to lose weight and noticed that he became tired easily and was weak.

On August 16th, when the patient was admitted, the right eyeball was red and covered with dilated blood vessels. He gave a history of inflammation and pain in right eye during the last part of March of this year, which after two weeks, became normal. The left eye then became sore. In May he saw a doctor who advised hot packs and some brown eye drops. From that time until August 5th his eyes did not bother him.

Physical examination demonstrated the following: an area of pannus was seen extending to the corneal border from the outer canthus. A similar area extended from above downward to the border of the cornea. At the upper border of the cornea there was an elongated crescent-shaped elevation and ulceration. About one millimeter inferior to its center was a small corneal ulcer. An opacity or scar is now found at the sight of the earlier lesion. However, during his ten weeks of sanatorium care he has had a scleral tubercle of each eye, each of which lasted about ten days.

In August, upon admittance, laryngeal examination demonstrated thickened, sclerotic vocal cords with irregular borders. No evidence of recent ulceration could be found. More painstaking examination done on October 27th revealed the epiglottis pulled downward and away from the tongue. Small nodular protuberances of mucous membrane are seen on the posterior or laryngeal surface of the epiglottis. The epiglottis itself is edematous, injected and slightly roughened, yet no ulceration can be seen. Edema and redness of the vocal cords and larynx are visible though the vocal cords are not ulcerated or paralyzed.

Examination of his skin shows several healed lesions. There is a rough scaling, eczematoid area on the instep and medial surface of the left foot. A brown, rough, irregularly oval area, the size of a duck's egg, is seen on the anterior aspect of the upper third of the left thigh. On the back of the neck is seen an area somewhat similar to the one on the thigh. Over the postero-lateral aspect of the right jaw from the hair line to the border of the mandible and occupying a strip four centimeters wide, is a smooth scar in the center of which is a stellate whitened area. A similar scar the size of a dollar occupies the angle of the left mandible. In neither of these areas are any hairs found.

Inspection of the chest reveals moderate retraction of both infra-clavicular fossae. Percussion demonstrates an impaired note over the whole left hemithorax with a dull note over the left base up to the level of the left nipple. Auscultatory findings include suppressed breath sounds throughout the lower half of the left chest with the sounds entirely absent in the left base. Crepitant and moderately coarse rales are heard over scattered areas throughout the upper portion of the chest on both sides. Pectoriloquy is heard in the left apex anteriorly. Vocal transmission is absent in the left base.

Laboratory findings include four positive direct smear and hydrocarbon flotation tests of sputum, and a positive 1:1000 intracutaneous tuberculin test. The diagonal sedimentation curve done upon admittance improved to a diagonal line in October. Interpretation of the x-ray films shows that there is mottling throughout both lungs with pleurisy at the left base. It is apparent that the last x-ray taken in October shows some slight spread of the pulmonary disease. In spite of this, his clinical course has improved as noted by a consistent drop in the daily temperature record and pulse rate, a steady gain in weight, and an improved sedimentation rate.

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*Paper discussed by J. A. Thabes, Brainerd; L. L. Culp, Minneapolis; Z. E. House, Cass Lake; R. W. Campbell, Cass Lake.

In view of the fact that these various lesions of tuberculosis have been diagnosed by such eminent authorities as Dr. Burns, Dr. Myers, Dr. Michelson and the Mayo Clinic, the correctness of the diagnosis is beyond refutation. As previously stated, it is unique to see all four lesions in the same case and their association raises these two questions: In the first place, what relationship has tuberculosis of one organ to tuberculosis of another organ? Secondly, how, if at all, is the prognosis of the case influenced by the multiplicity of the sites involved?

In the present case, judging from the history, it is impossible to determine whether the pulmonary tuberculosis preceded and caused the lupus vulgaris or vice versa. Our recent teachings appear to be questioned by Sequeira's statement. Dr. Michelson, who recently talked on this very subject before the Vienna Dermatological Society, has been kind enough to settle the question in his discussion of the case. He states:

"The case is one of frank lupus vulgaris. This is a true tuberculosis of the skin. In these patients there *is always an internal focus.* The tuberculin reactions are almost always of high grade and the condition is notoriously chronic in its course. The diagnosis is made by the more or less stationary plaque which is of a yellowish brown color and is made up of the so-called lupus nodules, which are visible when glass pressure is applied over them. They then appear as translucent, crab-apple jelly colored nodules surrounded by a firm, fibrous wall."

The second point of interest is the status of the laryngeal tuberculosis. Visualization of the larynx failed to show the usual ulcerations of a long-standing tuberculous laryngitis. The laryngeal tissues are roughened, red, injected and edematous. Laryngeal lesions were present when the cutaneous and pulmonary tuberculosis were first diagnosed. In 800 cases of lupus vulgaris Forchammer showed involvement of the mucous membrane in 72 per cent. Sequeira also found a large proportion of cutaneous tuberculosis involving mucous membranes, among which he mentioned the larynx. Consequently, may not the laryngeal involvement be a manifestation of the lupus vulgaris? Or is it, as is usually the case, a direct inoculation of the laryngeal membrane through positive sputum?

This patient has spent, at most, one year of the last 14 during which he has had pulmonary tuberculosis, in a sanatorium or under ideal therapeutic management. In spite of this, his general condition is at present better than fair. This brings out the fact recently stated by Senear that the presence of skin tuberculosis indicates a high degree of resistance to the tuberculous infection and, therefore, the prognosis as to the course of the latter is good.

Treatment of the conjunctival lesions requires some insight into their pathology. According to Alger, Erye found tuberculosis in only eight of 25,000 new eye cases in London. May says, "The nodules consist of lymphoid cells situated between the epithelial layer and sclera and Bowman's membrane respectively; the epithelial covering is pushed forward, softens, and is cast off, leaving an ulcer. The loss of substance is replaced with epithelium." Rest in bed, high caloric low carbohydrate diet, fresh air and general hygienic measures are important. Tuberculin is perhaps one of the most used remedies. The case recently reported by Alger, involving the palpebral conjunctiva, showed improvement by ultra violet irradiation twice a week in spite of the fact that the penetration of these rays is supposedly too superficial to be of advantage. These irradiations, of course, are given with the eyelids closed.

An important fact in the treatment of lupus vulgaris was brought out in the patient's history. For practically 14 years he went from one doctor to another, using salves, ointments, lotions, and even x-ray without influence on the skin lesions. Under proper treatment the lesions were healed in a few months. Dr. Michelson has written the following concerning the treatment of lupus vulgaris:

"The treatment is not satisfactory except in institutions that are properly equipped such as a Finsen Institute. There is a movement on foot to establish such an institute in this country which would be a good deal like the leper hospital at Carville.

"For this particular case I would recommend intense carbon arc exposures and cauterization of the individual spots. The heat in the carbon arc makes that treatment preferable to the alpine lamp."

Shortly after this patient had his tonsils removed his laryngeal symptoms appeared. Removal of tonsils has at times been advocated to clear up tuberculous laryngitis, yet Myerson has seen two cases of general miliary tuberculosis resulting from such procedure. This patient states that after spending eight months in Montana his hoarseness almost entirely disappeared. Edson and others believe that the patient with tuberculosis of the larynx has an advantage in high altitudes. The customary measures used in the treatment of the tuberculous larynx are: Silence, control of the cough, abstinence from alcohol and tobacco, topical applications, and ultra violet rays. More radical measures less frequently used are: Curettage, galvanocautery, coagulation, x-ray, radium, diathermy, Finsen lamp, and injection or section of the nerves.

* * *

OTHER PATHOLOGY ASSOCIATED WITH PULMONARY TUBERCULOSIS

Occasionally a case is seen in the sanatorium which has other pathology developing concurrently with the tuberculous disease. This case which has now been in the hospital sufficiently long to secure verification of the diagnostic impression represents that group. It is being presented as a diagnostic problem because symptom analysis is one of its most interesting features. For this reason a detailed history must be given.

Her present illness dates back eight years ago. At that time she had her appendix removed and since then she has never felt well. Two years ago she was operated upon for retroversion of the uterus, a suspension having then been done. Her symptoms have grown worse since then. Weakness, nervousness and pain in the chest have been her principal complaints. Soon after the second operation she coughed a great deal but has never expectorated. Now she has an infrequent dry cough. Though she has pains in the epigastrium and both lower abdominal quadrants, the accompanying nausea never results in actual vomiting. Her weight has decreased from 138 pounds three years ago to 98 pounds at present. She feels weak always and becomes exhausted easily. During the past 18 months pains in either or both sides of the chest have been a large factor in her illness. These pains are of a sharp shooting nature and are aggravated by motion. An x-ray taken in February, 1935, showed tuberculosis of the left lung as a result of which artificial pneumothorax was instituted. After the first pneumothorax treatment was administered, the dry hacking cough increased and it has continued ever since. For many years, she has had palpitation of the heart, and this also has been increased after each pneumothorax refill.

In that it denotes a diversity of complaints, her history by systems is interesting. Head: She has had frequent headaches for many years, but, since her hospitalization, these have occurred more frequently. Eyes: She has worn glasses for 16 years. Now her eyes tire easily and are painful. Nose: Dry scales form in her nose. Ears: Left ear has drained intermittently during the past 15 years. It still troubles her and she does not hear well. Mouth: Upper teeth have all been replaced by an artificial denture. All but eight of the lower teeth have been pulled. Her tonsils and adenoids were removed 13 years ago.

Regarding glandular symptoms she states that several years ago she was told by a physician that she had "goitre trouble," but after treatment, this did not bother her. Respiratory System: About 13 years ago she had a severe pain in her left lower chest. For the past two years she has caught cold after the slightest exposure. Cardiovascular System: She has frequent dizzy spells. At one time things turned black before her eyes. She was then told that she had "heart trouble."

Gastro-intestinal symptoms are as follows: She has nausea frequently, yet she does not vomit. Generalized abdominal pains occur often. These never remain persistently localized in the same place. Fat and greasy foods cause flatulence. Her abdomen feels best empty, and she never has any hunger pains. She has never been jaundiced, but is severely constipated a great deal of the time. No fresh or occult blood has appeared in the fecal matter. When she was a child she frequently vomited green material. Two physicians told her that she has gall bladder trouble.

Her menses started at the age of 16, but have never been regular. They vary in occurrence from 30 to 50 days, last from five to eight days, and the quantity of discharge varies. Sometimes through a period the discharge will stop, and, after a day or two, start again. Occasionally she notices a yellowish vaginal discharge either a week before or after her menses.

Still other complaints involve the urinary tract, the central nervous system and the spine and extremities. These are noteworthy only for their diversity. Epidemiological data states that a sister died of tuberculosis in 1927, and that an uncle died of tuberculosis years ago.

It is apparent from this history that although many of the cardinal symptoms of tuberculosis are present, pulmonary tuberculosis alone could not account for all the symptoms. A carefully taken history should indicate the leads to be followed in physical examination. In this case symptoms center about each tract, system or organ enquired about. Undoubtedly the respiratory symptoms and epidemiological data demand that a thorough search be made for tuberculosis. Beyond this, however, it is necessary to perform a sufficiently complete examination to discover one diagnosis, which alone, or with tuberculosis, will account for the multiplicity of complaints.

Such an examination was done, but it is necessary to give here only the pertinent facts, either negative or positive, learned through such an examination.

The patient is a poorly developed, poorly nourished, hyposthenic adult, white female, 33 years of age. Her color is pale and her cheeks are hollow with accentuated bony prominences. Intra- and extra-ocular muscles are normal. She wears glasses. There is a large calcareous plaque, in the center of which is a perforation, in the left ear-drum. The thyroid gland is very small. Areas of vitiligo are scattered diffusely over the trunk and thighs. Scars on the abdomen have healed without the pigmentation of the normal skin. Areolae of the breasts are pale and surrounded by circular areas of leukodermia. The heart rate is rapid but regular. Cardiac borders and maximum apex impulse are within normal limits. The systolic pressure was found to be 110 and the diastolic pressure 80. Physical examination of the chest, it may be stated for brevity, revealed findings consistent with a diagnosis of pulmonary tuberculosis with artificial pneumothorax of the left side. In palpating the abdomen tenderness was found in the upper abdomen. Both pubic and axillary hairs are very scanty. Bimanual examination of the genitalia failed to show palpable or gross abnormality. Since her admittance to the sanatorium her pulse rate has varied from 72 to 110 and her temperature has fluctuated between 97.2 degrees and 99.2 degrees.

Laboratory work has shown a positive reaction to a 1:1000 intracutaneous tuberculin test, insufficient sputum for testing, but a negative hydrocarbon flotation test of the feces for tubercle bacilli. The x-ray plate of the chest shows an area of mottling like tuberculosis in the second intercostal space on the left side, with a partial collapse of the left upper lobe by artificial pneumothorax. Chemical and microscopic examinations of the urine have repeatedly been negative. A 24-hour specimen of urine amounted to 2,775 cubic centimeters and had a specific gravity of 1.002. Webster states that normal urinary execretion for an adult is 1 cc. per kilo per hour, which, in her case, would be 1,536, based on her correct weight of 144 pounds rather than her present weight of 98 pounds. An average of four basal metabolic readings was minus 12 per cent. Fasting blood sugar was 86.9 milligrams per 100 c.c. of blood, and the sugar tolerance curve, one-half, one and two hours, showed 108.7, 133.3 and 120.4 milligrams respectively, a flat type of curve denoting increased sugar tolerance. The sedimentation rate was a diagonal line.

In analyzing this case the varied symptomatology is the predominant feature. Fever, loss of weight, pains in the chest, cough, expectoration, weakness and ease of fatigue can all be accounted for on the basis of pulmonary tuberculosis. Also enough of the diagnostic criteria of tuberculosis have been met that this diagnosis is unquestionable. On the other hand, headaches, nervousness, restlessness, pain in the abdomen, nausea, pain in the back, pain in the thighs, dizzy spells, constipation and menstrual irregularity cannot all be attributed to pulmonary tuberculosis. As a result some other pathology must be sought and it should be such that any or all of the symptoms may be caused by it.

Headache is one of the leading symptoms. This patient's headaches were not uniformly more severe in the morning as sinus headaches usually are, nor uniformly worse in the evening as eye strain headaches are described. Furthermore, the visual fields were normal, vision of the right eye being 20/20 and of the left eye 20/25, both without glasses. So it would seem the headache suggests some other pathology than tuberculosis, sinusitis or refractive error. According to Cushing some headaches are produced by increased intra-capsular pressure of the pituitary gland. Hypofunction of this gland causes increased tension by increasing the size of the gland. In reporting a series of pituitary headaches, Skipp describes the following additional symptoms: Nausea, vomiting, irritability, restlessness and dizziness. Perkins also includes, in addition to those listed, neurosis, pain in various locations, and vasomotor disturbances. Still another author mentions palpitation.

Thus practically all of the remaining symptoms can be explained, according to these authors, by a diagnosis of hypopituitarism. Do the balance of the clinical facts support this diagnosis? How may it be confirmed? Mazer and Goldstein state that in hypopituitarism there are a lowered basal metabolic rate, a low blood sugar, increased sugar tolerance, and menstrual irregularities. Roentgen study of the sella turcica showed it to be 12 mm. at its widest diameter, a normal measurement, which fact is consistent with this diagnosis. Metabolic studies showed a rate of minus 12 per cent, a finding which conforms with this diagnosis. Both the increased sugar tolerance and the low fasting blood sugar confirm this diagnosis. It is possible to determine the amount of anterior pituitary hormone in the blood and of estrogenic substance in the urine. Such tests have failed to demonstrate the presence of these hormones.

There is a second approach to the problem which may help in determining the diagnosis. The pituitary gland is the "master gland," and its activity influences many of the other endocrine organs. It produces a thyrotropic hormone. Decreased pituitary secretion leads to hypothyroidism, which is true in this case. The pituitary gland also produces an ovarian follicle-maturing hormone and a luteinizing hormone. Pituitary hypofunction results in a deficiency of one or the other or both of these hormones as manifested by irregular menses. Menstrual irregularity is evident in this case. Growth hormone is also a pituitary factor. This may be post-adolescent type described by Blumer and others in which growth anomalies are not so striking. Also the pituitary gland elaborates a diabetogenic hormone. Hypofunction of the pituitary would induce a low fasting blood sugar and an increased sugar tolerance, both of which are found in this case.

At this point it may be well to discuss the finding of a large 24-hour urine quantity with a low specific gravity. Normal urinary output for a patient of her weight should not exceed 1,600 c.c. Her 24-hour output was 2,775 cubic centimeters. Webster states that any amount over 2,500 c.c. may be considered polyuria. Blumer states that a specific gravity of 24-hour specimen between 1.001 and 1.005 suggests diabetes insipidus. Specific gravity of such a specimen in this case was 1.002. Should one prefer the theory that diabetes insipidus is caused by hypofunction of the pars intermedia or posterior lobe of the pituitary gland, rather than disturbed function of the thalamus or hypothalamus, one finds here also grounds for belief that hypofunction of the pituitary gland is a factor in this finding.

Dr. Hawkinson, of Brainerd, has said that when a thin, cachectic person has most of the findings of Addison's disease without increased pigmentation of the skin, hypopituitarism is the most likely diagnosis. This patient fits that picture. In fact all of this patient's symptoms and physical signs not accounted for by her pulmonary tuberculosis can be explained by pituitary hypofunction.

Our interest in the case rests in the fact that although she has pulmonary tuberculosis, this lesion is controlled or controllable, yet without resort to glandular therapy she will not be fully cured or rehabilitated. It is felt that now the pituitary hypofunction is a major cause of her residual symptoms and disability.

Dr. Burns: Among our twenty guests this evening, we have Dr. J. A. Myers, from Minneapolis. Few doctors are more interested in clinical medicine, especially that part dealing with the chest and tuberculosis in particular, than he, and few have shown more enthusiasm and given tuberculosis and the tuberculous more study and kindly support than he. We will be very glad to hear from Dr. Myers.

Dr. Myers: While listening to the cases presented by Drs. Wilson and Simons, I was deeply impressed with the thorough-going manner in which the material had been prepared and the clearness of its presentation, which was certainly equal to that of any large city clinic or a national meeting. The idea of holding clinics at the State Sanatorium at regular intervals is a very logical one and should make a strong appeal to the physicians in this entire section of the state. There is in this institution at all times, not only an abundance of patients suffering from the common chest conditions, but also a number of patients who have the more rare chest conditions and extrapulmonary tuberculous lesions. These cases should be used for teaching purposes, since in the private practice of the general practitioner no one is likely to see a large number of even the more common diseases and only occasionally, if at all, does he see or recognize the rare diseases. Attendance at these clinics and actual participation in the discussion, the clarification on points that are not understood or are not clear, together with the actual examination of patients, as is to be done at the end of each clinic, will make it possible for every general practitioner to become an excellent diagnostician in tuberculosis and other diseases of the chest.

Proper diagnosis is very important, not only from the standpoint of the physician's reputation in his community, but also from the standpoint of facilitating the care of the patients for whom this institution was built. It is true that in some sanatoriums for the tuberculous in this country as many as 20 per cent of the patients admitted do not have clinical tuberculosis. This may be due to insufficient training on the part of the physicians or to lack of facilities for making accurate differential diagnoses. If it is due to the former, it may be easily overcome through just such meetings as this and, thus, the sanatorium staff will be spared a great deal of time and effort with patients who do not belong to this institution. Again, tax money will be saved if such patients are not admitted to the sanatorium. If the physician does not have the facilities for making differential diagnoses, then he may be justified in sending some cases to the sanatorium for that work.

The Minnesota State Sanatorium is unique among such institutions of the country in that it has very fine provisions for the treatment and study of tuberculosis among American Indians. The building in which we are meeting, constructed especially for Indians, is one of the most modern sanatorium structures in America. With eighty-five Indian patients, ranging in age from a few months to ninety-four years, already occupying beds, with a much larger bed capacity already available as soon as maintenance funds are provided, and with four hundred Indian patients on the waiting list, it is obvious that the opportunities are here to make much-needed contributions to our knowledge of this subject. All of this material will be available for your clinics.

For many years I have taken great pride in developments in the field of tuberculosis which have been initiated in Minnesota. The work of Dr. Slater at the Southwestern Minnesota Sanatorium, at Worthington, on the tuberculin test in 1924, has been quoted around the world and has led to the very general use and practical application of this test. The work of Drs. Kathleen and Lewis Jordan at the Riverside Sanatorium, Granite Falls, on tuberculosis among school teachers, has stimulated wide interest in this subject throughout the nation. The pathological studies of Robertson at the Mayo Clinic on the persistence of tuberculous infections have brought us to realize the seriousness and duration of first infection type lesions, which at one time were considered so innocent, harmless, and even beneficial. The classical work of Lemon at the Mayo Clinic on pre-allergic and post-allergic manifestations of tuberculosis in animals has done much to remove controversy from certain phases of tuberculosis. These are but a few of the many fine contributions from this state.

In my opinion one of the finest steps that has ever been taken by the State Sanatorium was the establishment of an epidemiological service. Tuberculosis is a communicable disease and as such has its epidemiological aspects just as truly as other communicable diseases, such as diphtheria and typhoid fever. It is difficult to understand why this step was so long delayed in our tuberculosis control work.

Another very important fact is that the staff of this institution was among the first to recognize that children with the first infection type of tuberculosis do not require institutional care and that recognizing this fact the members of the staff had the courage of their convictions and recommended the closing of the beautiful children's building, which was accomplishing nothing significant of a therapeutic or preventive nature and was probably actually doing harm to the children admitted. Once the children were discharged from this building, it was immediately re-opened for patients suffering from the re-infection type of disease in a communicable form. In this capacity the building is serving the state in an excellent way and is doing much to control tuberculosis both in children and adults. The beginning, tonight, of clinics for physicians and others interested in tuberculosis, enlisting the sanatorium in the group of educational institutions, is another one of the very fine movements instituted by this staff. With a splendid plant equipped with the finest facilities for diagnostic and therapeutic work, with a highly trained medical staff, who have an understanding of preventive medicine, together with the fine attitude of the practitioners of medicine throughout the counties this institution serves, one can safely predict the success of these clinics, the continued success of other activities previously initiated, and the birth of still other unique measures in tuberculosis control.

NEWS ITEMS

Ambrose, N. D. has opened a new hospital, with Mr. Harold Viestenz, as manager.

Dr. Leonard Moyer, Carson, has been elected a vice-president of the North Dakota Health Officers Association.

Dr. Leo M. Maguire, Minneapolis, has been promoted to chief of staff, of the Veterans' Hospital at Fort Snelling.

The new Hudson, S. D., Community Hospital, was officially dedicated last month. Dr. M. W. Larson will be at its head.

Dr. J. W. Hanson, a graduate of the University of Minnesota, has opened offices for general practice at Fairmont, Minn.

Dr. S. L. Koch, Chicago, will be the guest speaker at a meeting of the Hennepin County Medical Society, on Monday evening, January 6.

Dr. C. C. Allen was elected president of the medical staff of St. Olaf Hospital, Austin, Minn., at its annual meeting recently held in that city.

Dr. B. J. Bouquet, of Caledonia, has purchased the practice of Dr. C. G. Ochsner, of Wabasha, Minn., and is already located in that city.

Dr. Gowan Ferguson, dean of the medical and surgical practitioners of Great Falls, Montana, passed away on December 7, at the age of 69 years.

Dr. F. J. Freshley, formerly of Gary, Ind., has moved to Wessington Springs, S. D., and is now associated with Dr. H. E. Jenkinson in general practice.

Dr. Thomas Orr, Kansas City, Mo., was named the new president of the Western Surgical Association, at the annual meeting held at Rochester, Minn., last month.

Contracts have been awarded for over $200,000 for additions and equipments for the six story building for the North Dakota tuberculosis sanitarium at San Haven.

Drs. Michelson and Spratt, of Minneapolis were the guest speakers at the monthly meeting of the Scott-Carver Medical Society, held at Waconia, Minn., last month.

Dr. Thomas Mulligan, Grand Forks, N. D., made a fine address before the members of the Fortnightly club of that city, speaking on "The Rule of the Emotions in Physical and Mental Health."

Drs. Arthur T. Rowe, and Paul Wiberg, both graduates of the University of Minnesota Dental School, were killed at Columbia University, N. Y., on December 13, by a discharged employee of that university.

Dr. Robert B. Radl, Minneapolis, is now located at Bismarck, N. D., with the Clinic of that city, where he will specialize in internal medicine. Dr. Radl graduated from the University of Minnesota in 1924.

Dr. J. M. Scanland, former well known Montana physician, as the head of the State hospital at Warm Springs, for over 20 years, has been appointed superintendent of the Nape State Hospital, California.

Tuberculin tests are being used at the Billings, Montana, high school to determine if any pupils have symptoms of tuberculosis. These tests are to be financed with the returns from the Christmas seal sale at Billings.

Dr. Wyman G. Hough, Malta, Mont., died suddenly at Great Falls, the result of uremic poisoning, which he had been suffering for several months. Dr. Hough was a graduate of the Rush Medical College.

More than 4,000 physicians and surgeons are expected to attend the annual meeting of the International Assembly of the Interstate Post-Graduate Medical Association when it meets in St. Paul, October, 1936.

The Steele County Medical Society held its annual meeting at Owatonna, Minn., and elected Dr. L. V. Berghs, Owatonna, president; Dr. E. Q. Ertel, Ellendale, vice-president, and Dr. J. F. Schaefer, Owatonna, secretary.

At the annual meeting of the Mower County Medical Society, held at Austin, Minn., Dr. J. K. McKenna, Austin, was elected president; Dr. J. M. Thompson, Brownsdale, vice-president, and Dr. P. A. Robertson, Austin, secretary.

Dr. W. D. Smith, a practicing physician at Harlem, Mont., for the past 25 years, was found dead at his office, the result of a bullet wound in his head. The doctor sadly grieved over the illness of his daughter, was the cause of the suicide.

Dr. Jacob Wells Meighen, one of the pioneer physicians of Ulen, Minn., died at a Minneapolis hospital, on December 14, the result of a paralytic stroke. Dr. Meighen was 72 years of age and a graduate of the University of Minnesota.

A meeting of the Sixth District Medical Society was held recently at Bismarck, N. D., at which time Dr. K. E. Miller of the U. S. P. H. S., and Dr. McCown of the U. S. C. B. gave talks on various phases of the National Social Security Act.

At its annual meeting held at Huron, S. D. on December 16, the new officers of the Huron District Medical Society elected for this year are: Dr. G. E. Burman, Carthage, president; Dr. W. H. Griffin, Huron, vice-president, and Dr. R. A. Buchanan, Huron, secretary.

Dr. Myron O. Henry, Minneapolis and Dr. J. C. Swanson, Fargo, held an orthopedic clinic in Minot, N. D. on December 11, for the Crippled Children's Committee of the Elks Club. A large group of patients were examined and recommendations were made for further treatment which will be carried out by the Elks Club.

The District Medical Society held its annual meeting at Watertown, S. D. on the evening of

December 12, and elected the following officers for 1936: Dr. C. M. Jorgenson, Watertown, president; Dr. A. E. Wilkinson, Hayti, vice-president; Dr. A. E. Johnson, Watertown, secretary, and Dr. G. W. Magee, Watertown, censor.

Dr. Elias P. Lyon, dean of the school of medicine of the University of Minnesota, spoke on "Socialized Health and Education in Russia and Other European Countries" at a meeting sponsored by the League for Political Progress and Social Science Study club, of Minneapolis. Dr. Lyon recently returned from Leningrad, Russia, where he attended the International Physiological Congress.

More than 50 doctors from all parts of the state attended the Minnesota Radiological Society business and scientific meetings at Minneapolis last month. The program included speeches by Dr. John D. Camp, Rochester; Dr. C. O. Hansen, Minot, N. D.; Dr. C. A. Stevenson, Rochester; Dr. E. T. Leddy, Rochester, and Dr. W. K. Stenstrom, Dr. Lewis Jacobs, Dr. C. N. Borman, Dr. M. J. Shapiro, Dr. Oscar Lipschultz and Dr. A. L. Abraham, all of Minneapolis.

Every practitioner of medicine and surgery holding a license to practice in North Dakota is required by law to register annually on or before January 1, with the secretary-treasurer of the board of medical examiners, and at that time to pay a fee of $5 if a resident of North Dakota, or $2 if a nonresident. A practitioner may not lawfully practice if he has not registered. If he does so his license may be revoked and can be re-instated on the payment of unpaid fees and $0.50 for each month of default.

The Minnesota State Medical Association broadcasts weekly at 10:00 A. M. every Monday over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota is the speaker. The program for the month will be as follows: January 6, "Fever Treatment"; January 13, "Hysterical Paralysis"; January 20, "Bronchiectasis"; January 27, "Pyorrhea and Gingivitis."

The Minnesota State Medical Association has prepared a forty-eight-page handbook dealing with the various aspects of sickness insurance and state medicine, supplementing material available from the Bureau of Medical Economics of the American Medical Association. Excerpts from talks, newspapers and current magazines are included, representing the opinions of certain members of the medical profession, clergymen and lay authorities on the subject. The material is copyrighted but may be used by members of the constituent societies of the American Medical Association. Information concerning the handbook may be obtained from the office of the association, 11 West Summit Avenue, St. Paul.

The seventh district medical society held its annual meeting at Sioux Falls last month. Featured on the program was I. D. Weeks, president of the South Dakota University, and two members of the University medical school. Dr. J. C. Ohlmacher, dean of the medical school, presented a paper on "Medical Education and the Medical Profession" and Dr. C. A. Hunter, director of the university laboratory, on "Immunity and Its Practical Application." The entire 16 officers, headed by Dr. Will E. Donahoe, president, were unanimously re-elected following the program. The officers are: Dr. F. C. DeVall, vice-president; Dr. H. R. Hummer, secretary; Drs. Monte A. Stern, R. Reagan, John B. Gregg, O. Charles Erickson, R. W. Mullen, members of the medical economics committee; Dr. N. J. Nessa, councilor; Drs. E. L. Perkins, G. E. Van Demark, Charles E. Culver, censors, and Drs. Stern, C. E. Forsberg, Roy Stevens and Gregg, delegates.

The Twentieth Annual Session of the American College of Physicians will be held in Detroit, March 2-6, 1936. Dr. James Alex. Miller, president of the college, has arranged a program of general scientific sessions of great interest to those engaged in the practice of Internal Medicine and associated specialties. Dr. Charles G. Jennings, Detroit, is the General Chairman of the Session, and is in charge of the program of clinics and demonstrations in the hospitals, medical schools and other Detroit institutions. Dr. James D. Bruce is vice-chairman of the committee on arrangements, and has in charge the preparation of an all-day program to be conducted at the University of Michigan on March 4. Dr. Walter B. Cannon, Professor of Physiology at Harvard University Medical School, will deliver the annual Convocation Oration on "The Role of Emotion in Disease." Dr. Miller's presidential address will be on "The Changing Order in Medicine." About fifty eminent authorities will present papers at the general scientific sessions, while clinics and demonstrations will be conducted at the Harper, Receiving, Ford, Grace, Herman Kiefer and Children's Hospitals, of Detroit.

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Organized Medicine in the United States

A Brief Historical Sketch

IT IS extremely interesting to notice that American medicine in its early development went through all the stages through which European medicine had gone, the only difference being that it happened in a much more concentrated space of time. We had a period of clerical medicine, just as the early Middle Ages had. Then the physician was a craftsman educated by serving several years of apprenticeship to a master, just as the Hippocratic doctor had done. The first European hospitals were institutions of a very different character from what they are today. They were not devoted to the treatment of patients—they were almshouses, guest-houses, *xenodochia,* places where the poor and sick, who had no homes of their own, could find shelter. And the same happened in this country, where in 1612, already, in Henricopolis on the St. James River, such a house was erected long before the first real hospital, the Pennsylvania Hospital in Philadelphia, was built. The first incunable in European Medicine was not a big book, but was a single sheet printed in 1456, and containing instructions for blood-letting. And in the same way, the incunable of American medicine is not a book, but a single leaf, Thomas Thacher's "A Brief Rule to Guide the Common People of New England How to Order Themselves and Theirs in the Small Pocks or Measles." This parallelism is undoubtedly no mere coincidence, but a proving of the rule that similar conditions bring about similar events. . . .

Down to end of the 18th and during the beginning of the 19th century, the development of American medicine was absolutely sound. Under great adverse conditions the maximum was done that could ever be expected. Medical schools were founded from 1765 on, the curriculum of which was more modern than in many European universities. America had the great advantage that it was not hampered by medieval traditions. In establishing new educational institutions, it could follow the inspiration given by the best faculties to be found in Europe, those of Leyden, Edinburgh, Göttingen, Vienna. The first hospitals erected in this country, the Pennsylvania Hospital (1752), New York Hospital (1776), Massachusetts General Hospital (1821) were greatly admired abroad. In Europe there are a good many hospitals that can trace their history back to the Middle Ages, but some of them have remained to our days in medieval conditions.

But then, in America, during the 19th century, an enormous expansion took place, the conquest of a gigantic territory, the colonization of a continent. The nation grew, and it grew too fast. We know that when an organism develops too rapidly, disturbances are bound to occur. The frontier became the determining factor in American life. History repeated itself over and over again. Medical help was needed, and it was welcomed wherever it came from, and in whatever form it was manifested. Hundreds of medical schools were founded, many of them poorly equipped, and giving a poor training. The doctors who wanted a higher medical education still had to go to Europe, and it was to Paris now, then Vienna, and finally Germany, where they went.

A Frenchman of rank and great vivacity, the Marquis de Chastellux, visited the nascent United States during the Revolutionary War, 1780, 1781, and 1782, and has provided a racy and amusing, as well as instructive account of what he saw and did. By no means the least interesting of his lively sketches deal with the physician of the time and country: and it seems that a translation of some of his story might not be uninteresting to those of the present day.

Visting the camp at Fishkill, he says: "A moment afterwards, the Doctor of the Hospital, who had seen me passing and had recognized me as a French Officer, came with much courtesy to enquire if I wished for anything, and to offer me everything in his power. Now, I make use of the English word 'Doctor,' because the distinction of Surgeon and Physician is no more recognized in the Army of Washington than it was in that of Agamemnon. We read in Homer that the physician Macaon himself dressed the wounds; but our physicians who are not Greeks do not wish to follow his example. The Americans conform with the ancient usage and find it convenient—they are perfectly content with their 'Doctor' for whom they show the very greatest consideration. Doctor Graig, whom I knew at Newport is the intimate friend of General Washington; and latterly, Lafayette had as Aide-decamp, Colonel MacHenry, who, last year, exercised the function of Doctor to the whole army. . . ."

Of the English that settled in America, most of them had one or several doctors in their colonies. Then we know the name of the first physician in the first permanent settlement in this country—a Dr. Thomas Wooton, surgeon general of the London Company and surgeon general to Captain John Smith when his people settled at Jamestown. A short time after the settlement of his colony, Dr. Walter Russell, a well trained physician, arrived, and in 1610 a third physician, named Dr. Lawrence Bohin, made his addition to the colony. Strangely enough, none of these men remained in the colony long, with the exception of Dr. Wooton and a Dr. John Pratt, who arrived from England in 1624 and was made temporary governor of the colony in 1628.

Early Virginia doctors made a beginning of one good work, the completion of which still depends on the activities of the present day physicians. They stirred up the stolid members of the Assembly in the year 1639, to pass laws regarding the regulation of medical practice. In that day methods of practice were loose and medical standards were lacking. Quackery flourished, but with little hindrance to the men with good medical training.

Science came to Plymouth from England in 1620, brought there by one of the Mayflower group, a Dr. Samuel Fuller, medical practitioner and divine, who died at Plymouth in 1633 of a contagious disease caught from one of his patients. He was responsible for the survival of his colonists during their first winter, due to the beneficial effects of a small drug supply which he had brought with him.

In New York before 1700 there were Dutch, English and Huguenot doctors. They differed from the New England doctors in the respect that more of them had university degrees. William Penn's colonists, who settled in Philadelphia, had with them Dr. Thomas Wynne, who was undoubtedly the most learned man who had until that time come to America.

It is not easily determined what the colonial conditions were which called for medical service. Children were born without troubling doctors much, and after the first few years of the struggle for the survival of the fittest, ordinary trifling illnesses known to us in an overcrowded civilization were practically disregarded. The sturdy frontier folk, leading a life of exposure, much in the open and ignorant of the bane of congested living conditions, had little need for doctors except for major ills. They were educated in the rudiments, intelligent and not afraid to work. Earnest, God-fearing men who drove the plow, read their bibles and sent their eldest son to Harvard College, and women who treasured bits of family silver, discussed the state of the elect and did their own cooking for their large families, were not likely to be the parents of dyspeptic girls or boys unable to stand the rigors of the times.

We read, however, of grievous surgical conditions and fierce epidemics sweeping over the land. Smallpox, yellow fever, typhoid fever, scurvy, dysentery, influenza and various other contagious diseases were foes with which the doctors mostly had to contend. Epidemics were most frequent in the northern colonies, where ships came in often to the larger ports.

The field of general medicine struggled to establish itself on a progressively scientific basis. The earliest record of an autopsy in America is found in "An Account of Two Voyages to New England," published in 1674 in London, by Dr. John Josselyn, who had spent a short time in New England.

In 1700 the population of North America was about 300,000; at the close of 1799, nearly four million.

Two of the most notable advances in science and the practice of medicine made in this country originated in Boston. Both received their impulses from men not strictly occupying the ranks of physicians, and from both arose notorious controversies and scandals which are without precedent in modern science. First of all, smallpox inoculation rent the profession of medicine, and society as well, and later ether anesthesia raised storm and controversy.

The origin of the American Medical Association can be traced to a national convention of delegates from medical societies and colleges called by the Medical Society of the State of New York. This meeting was called for the purpose of raising the standards of medical education. The convention was held at New York University, May 5, 1846.

Exactly one year later, May 5, 1847, 250 delegates met in Philadelphia. This meeting resolved itself into the first session of the American Medical Association. All through the historical articles, repeated mention is made of raising the standards of medical education. A code of ethics was established; a constitution was adopted which encouraged the formation of state and county societies. The person who deserves more credit than any other for the organization of the American Medical Association was Nathan Smith Davis. For more than 60 years he worked for the highest ideals in medical journalism and organization.

Nathanial Chapman was elected first president of the American Medical Association; although he had not been active in its organization he was nevertheless one of the oldest and most eminent teachers in the union and stood at the head of the profession.

At the meeting in 1848, Oliver Wendell Holmes urged American physicians to publish their material in this country instead of writing for European journals.

Up to 1882 scientific papers had been published in the annual transactions and were essentially buried there. At the meeting held in St. Paul, it was estimated that the publication of a journal would require $15,000. It was decided to open the membership to all members of state and county medical societies, to increase the dues to five dollars annually, and establish a weekly journal, with a charter and a board of nine trustees. In July, 1883, the first number of the *Journal of the American Medical Association* appeared. In 1897 the association was incorporated in the state of Illinois.

The great cry in the early day was higher standards of preliminary education and of medical education as well. Those who controlled the medical schools, which naturaly were very inadequate and poorly-equipped, wished to have all the students they could get. Therefore, they kept the requirements for admission down so that any one who had a desire to enter the school was most acceptable. On the other hand, the practitioners of medicine who were not connected with any school, wanted as few practicing physicians as possible, so they strove for higher requirements and more extensive training.

It required a considerable amount of work and grief on the part of the Council on Medical Education and Hospitals finally to get the requirements for medical education regulated, to dispose of many inferior medical schools and to classify the others. The work of this Council on Medical Education and Hospitals has accomplished more for organized medicine than has any other committee or association. It would have been impossible to have attained any semblance of an organization without the accomplishments of the council.

Most of our medical societies are organized on a truly democratic basis and each one of them has some form of legislative body, or committee, or group of delegates, so that the control of organized medicine is in the hands of these groups that are elected by members of the society. This results in the policies and activities of the societies being in the hands of the members themselves.

It is difficult to conceive of a more satisfactorily organized group than are the medical men of this country through the American Medical Association, with its board of trustees, its several councils to attend to special affairs, the house of delegates composed of representatives from each state society, which are in turn elected by delegates sent from each county society.

The scientific activities are equally well in hand through the Council on Scientific Assembly, and, in the state and county societies, through either a special committee or a much overworked secretary.

One of the great problems confronting organized medicine at the present time is that of obtaining a closer relationship between the medical profession and the people. The by-laws of the Minnesota State Medical Association have provided for a Committee on Public Health and Education, some of the functions of which are to develop an intelligent public viewpoint toward the medical profession. Moreover, this committee co-operates with various agencies through the state, the purpose of which is to promote public helth and the governing bodies of which are in whole or in part laymen. This committee has been in existence for several years, and through the able efforts of its members, has accomplished a great deal. It has done much toward producing a united medical profession in the state. As a result, the Minnesota State Medical Association, the public health organizations, and any other bodies that deal with matters of health, are fused into one large group under the direction of a single secretary.

The most important feature in the Minnesota plan of organization is that every medical activity in the state is under the direct supervision of the executive secretary, who in turn is advised by the Committee on Public Health Education or by the Council of the State Medical Association.

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The Development of Medicine in the Northwest

With Reference to Its Organization

When the great Northwest Territory was opened for pioneer settlement and exploitation, it was perhaps only natural that medical practice itself should have been inaugurated by the agency which preceded actual colonization: the United States Army. Thus, the first physician of whom there is any record as a resident of Hennepin County, Minnesota, was Dr. Purcell, who was stationed at Fort Snelling in 1820, remaining there for several years. The first civilian physician of record was a Dr. Ira Kingsley, whose claim to a valid degree of doctor of medicine does not appear to be very secure, inasmuch as he was known to be an herbalist by admission, and was later a justice of the peace. He landed at what is now Minneapolis in 1849.

Hennepin County's first genuine physician was Dr. John H. Murphy, who likewise settled in Minneapolis (or more correctly, St. Anthony) in 1849. But he apparently left St. Anthony in 1850, for he was not here when Miss Godfrey, the first white child born in the village of St. Anthony, was born in that year. He did, however, return to St. Anthony, and was already in practice when Dr. A. E. Ames announced that he would go into partnership with Murphy, in the fall of 1851, through the medium of *The St. Anthony Express*. Dr. Hezekiah Fletcher came to St. Anthony in 1851, as did also Dr. N. E. Morey.

By the year 1856, enough physicians had located in what is now Minneapolis to permit formation of the Hennepin County Medical Society. Its first president was Dr. A. E. Ames, who served as its head (concurrently with other men) for no less than 10 terms.

Across the river, organized medicine in Saint Paul was no less energetic in amalgamation. The first medical school of any sort in the state of Minnesota was located on the second floor of a building which stood to the left of Saint Joseph's Hospital in St. Paul; and its instructors were Dr. D. W. Hand, Dr. D. A. Stewart and other pioneering pedagogues. This was in 1868. In 1871 there was organized the St. Paul Medical School, Preparatory, under the good graces of the American Medical Association. Its president was Dr. Alexander J. Stone, and he was also chief of the department of obstetrics and gynecology. It had as surgeon and anatomist, Dr. Charles A. Wheaton, of St. Paul, "the ablest surgeon of his day in his home city."

Meanwhile, *The Northwestern Medical and Surgical Journal* was established. This publication has had a glorious part in the shaping of medicine in the Northwest, for it was the first medical journal in the state, and was, of course, the direct predecessor of THE JOURNAL-LANCET, which has been published continuously for 65 years.

The St. Paul Medical College merged with Hamline University in the year of its foundation. There was no pretentious medical school in Minneapolis until the year 1883, when the Minneapolis College of Physicians and Surgeons was founded, although there had been a medical college in Winona since 1872, organized by Dr. Franklin Staples. The Minneapolis College of Physicians and Surgeons was unique in medical circles of the time—its faculty members fought aggressively for the college, and were bound to each other by strong ties of devotion. The college itself essayed to provide a three-year course with a six-month period, which later was modified in 1903 to a nine-month period.

It was Dr. Perry H. Millard, originally of Stillwater, later of St. Paul, to whom much credit for the formation of the medical school of the University of Minnesota must go. He discovered a provision in the State Constitution of 1853 under which a department of medicine might be established at the University. It would have been a most unusual medical school, however, since the Constitution said nothing about teaching, but merely allocated examining powers to the University, under which graduates of any colleges might be examined for a certificate of approval. Dr. Millard proceeded to induce the Board of Regents to found a department of medicine in 1883, with Dr. Charles N. Hewitt, of Red Wing, as its chairman or chief. In that same year the Legislature was induced to pass an act to regulate the practice of medicine in the state, the faculty of the University of Minnesota Medical School to act as examiners. Thus, organized medicine was firmly entrenched in Minnesota by 1883, with complete governing power assigned to it by the state government. A steady program of expansion was then instituted, culminating in 1908 by the unification of medical teaching in Minnesota, the Minnesota Hospital College, the St. Paul Medical College, the Minnesota College of Homeopathic Medicine having already surrendered their charters to the University in 1888. In 1908 the unification was complete, as the Hamline University Medical School at that date merged with the University of Minnesota Medical School.

The organization of medicine in South Dakota was much tardier. The first governor of Dakota Territory was a physician, Dr. William Jayne, of Springfield, Illinois; but medical practice in South Dakota did not have the impetus of a state government to guide it, since South Dakota did not enter the Union until 1889. A group which sent delegates to the American Medical Association's convention was organized, however, in the year 1882, and its sponsors were Dr. Pine and Dr. Rose, both of Milbank, Dakota Territory. This group was then called the Dakota Medical Association, and permanent officers included Dr. S. B. McGlumphy, president; Dr. O. S. Pine, 1st vice-president; Dr. A. Grant, 2nd vice-president, and Dr. H. G. C. Rose, secretary. Drs. McGlumphy and O. S. Pine attended the American Medical Association's convention that year.

It was known that there was a society called the Black Hills Medical Society, for delegates from that body attended a special meeting of the Dakota Medical Association in August of 1882 at Canton; but thus far no records of an early society located in the Black Hills have been found.

The Dakota Medical Association was characterized by a slow but healthy growth. The Territorial Legislature of Dakota in 1885 passed an act which established territorial and county boards of health, providing for the protection of both persons and animals, and the bill was signed by Governor G. A. Pierce on March 12, 1885. At the meeting of the Dakota Medical Association of that year, it was decided to unite more firmly and a constitution and by-laws were drafted and adopted unanimously. The following year, the Central Dakota Medical Society sent delegates to the Association, being the second subordinate group to do so. The Dakota Medical Association was formally incorporated during 1886.

At the ninth annual meeting of the Dakota Medical Association, held in Sioux Falls on June 20, 1890, a resolution was raised and passed to have all proceedings of the Association to date printed. Every member of the Association received one copy, and 160 in all were printed.

Records indicate that on June 10, 1891, the South Dakota Medical Society was incorporated, and that incorporation was completed at a special meeting at Mitchell on June 11, 1891. Members of the old Dakota Medical Association joined this newly-created state association at this special meeting.

At the 25th annual meeting of the association on May 22, 23, and 24, 1906, Dr. W. A. Jones, of Minneapolis, then publisher of THE JOURNAL-LANCET, appeared before the convention to suggest that THE JOURNAL-LANCET be chosen as the official journal of the South Dakota Medical Society; but a committee voted to continue printing transactions in pamphlet form, as in the past. At the 26th annual meeting at Sioux Falls, however, in 1907, a contract was entered into which made THE JOURNAL-LANCET the official publication of the association.

In 1911, the House of Delegates and the Board of Councillors revoked the charter of the Hot Springs District Society. By this time, progress had been made in the representation of organized medicine at the state capitol, and was vitally interested in writing a new bill to cover the State Board of Health. In 1913, Doctors McCauley and Alway drafted such a bill, but the governor of the state deleted the very recommendations which would have vested powers of appointment in the State Medical Association. In 1914 a step forward was taken when Dr. J. L. Stewart, of Spearfish, was appointed special organizer for the State Association. He presented his report in 1915, at the 34th annual meeting in Sioux Falls. It is interesting to notice that in 1916, long before the social workers and professional idealists took up the issue, health insurance was considered by the South Dakota State Medical Association in the Communication of National Scope emanating from the American Medical Association. In this year, also, the chiropractors introduced a bill into the state Legislature, which was defeated.

The World War found the South Dakota State Medical Association strong and aggressive. Two hundred of its members entered the Medical Corps of the United States Army, and nearly 500 in the state were co-operating in some manner with the armed forces of the country. The dues of the association were raised to $6.00 per capita in 1921, and in that year the Committee on Medical Legislation drafted what would be known today as a Basic Science Law. This bill was not passed.

A fight against the osteopaths occupied the association in 1925, and was remarkably successful. One osteopathic bill would have allowed osteopaths to practice major surgery; another would have admitted them into any hospital in the state. Both bills were defeated.

The fiftieth annual session of the South Dakota Medical State Association was held in connection with the North Dakota State Medical Association on June 1, 2, 3, and 4, 1931, at Aberdeen, South Dakota. Since that date, the South Dakota State Medical Association has become progressively stronger, until today its position as regards membership and legislative influence is enviable.

Medicine in North Dakota probably owes its organization to the crossing of the state by the Northern Pacific Railway in 1872, which made Fargo the chief city of the state. By the year 1880, Fargo had a population of 1,000 among whom were at least 12 physicians. That same year, according to Abbott's *Fargo Directory*, there was founded the Red River Medical Association. The Cass County Medical Society was founded in 1881, with Dr. R. T. Rolph as president. It should of course be remembered that the physicians of North Dakota functioned as entities in the old Dakota Medical Association until the year 1887, when Dr. J. G. Millspaugh, of Park River, organized the North Dakota Medical Society. Its constitution contained the Code of Ethics promulgated by the American Medical Association, and although many changes have been made since the enactment of that constitution, the North Dakota Medical Association has today as stout and sturdy an internal organization and unity as any in the land.

Medical practice prior to North Dakota's admission to the Union was regulated by the Legislative Code of 1869, and later by the code of 1875. The first Legislature (1889) received a bill from a committee of physicians which provided for control of medical and surgical practice. This bill was signed by the governor of the state on January 10, 1890, and continued in effect until passage of the Medical Practice Act, in 1911.

The North Dakota State Medical Association will celebrate its 50th anniversary in 1937, just one year after THE JOURNAL-LANCET observes its 65th anniversary, and its half-century of existence will find it more firmly entrenched and more powerful than ever.

The following are sketches of the first presidents of the medical associations of North Dakota, South Dakota and Minnesota. We regret that no material was available concerning the first president of the Montana State Medical Association.

JOSEPH G. MILLSPAUGH, M.D.

First President of the North Dakota State Medical Association

James Grassick, M.D.
GRAND FORKS, N. D.

DR. J. G. MILLSPAUGH was born at Battle Creek, Michigan, Feb. 19, 1851. His parents were of the early Holland stock of New Amsterdam. Dr. Millspaugh received the degree of B. A. from Hope College, Michigan, and later that of M. A. from the same institution. In 1876 he graduated from the Medical Department of the University of Michigan and in 1877 from the College of Physicians and Surgeons, New York. Thus equipped he practiced in his native city until 1882. Answering the Call of the West he came to the Territory of Dakota then opening for settlement. After two years of life in the open where he received strength and inspiration, as did many another under like conditions, he again took up the practice of medicine with office at Park River, D. T.; and here he remained for seven years. There were at that time less than a hundred physicians of all classes in what is now North Dakota, and he conceived the idea of collecting the scattered members of the profession and welding them into a compact unit for mutual benefit and advancement. With this end in view, in 1887, at Larimore, the North Dakota Medical Society was organized and Dr. Millspaugh was its first president. This position he held for three consecutive years. It was while serving in this capacity and shortly after the admission of North Dakota to statehood that he had draughted a bill to regulate the practice of medicine in the new state. It was fathered in the Legislature by the late Dr. John Montgomery of Ardock, became law and was known as the Medical Practice Act of 1890. This meritorious measure placed North Dakota in the front rank as far as the practice of medicine was concerned. Thus due to the activity and ability of this far-sighted doctor was laid the solid foundation on which have been reared the fine structures of succeeding Medical Practice Acts. It was a fitting recognition of his leadership in medical circles that he received from Governor John Miller the appointment of State Superintendent of Health, the first to hold that important office in the new state. In 1881 he moved to Little Falls, Minnesota, where he resided and practiced his profession until his death.

J. G. Millspaugh, M.D., 1851-1927

Dr. J. G. Millspaugh was a splendid type of the cultured progressive physician. He gave freely of his time, talents and energy in solving the many problems, social, economic, and professional, that confronted the new commonwealth in which his lot was cast. The best that he had of young, vigorous manhood, sterling integrity, and ripe scholarship were placed on the altar of service, and he is gratefully remembered as the father of organized medicine in North Dakota.

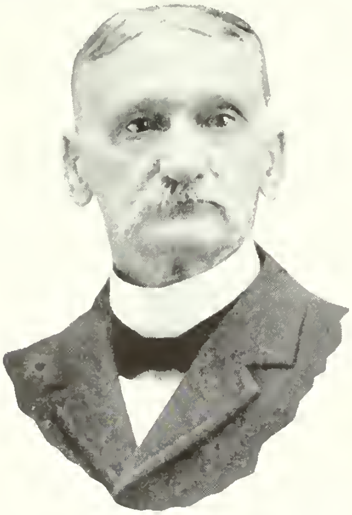
SAMUEL B. McGLUMPHY, M.D.

First President of the Dakota State Medical Society

J. F. D. Cook, M.D.
LANGFORD, S. D.

BORN August 27, 1837, at Cannonsburg, Washington County, Pennsylvania, he was one of a family of four children born to Samuel and Nancy McGlumphy. Alexander, Andrew, Mary, were the other children. His father was a farmer and coal dealer.

He received his early education in the public schools of Cannonsburg in the winter. During the summers he was tutored by a woman teacher. He attended Waynesburg College, Pennsylvania, one year, he then moved to Illinois where he attended Mount Zion Male and Female Seminary for two years. He read medicine under Dr. Buckworth of Mount Zion, Illinois, for two and one half years. Entered Rush Medical College in 1862, and graduated in 1864.



Samuel B. McGlumphy, M.D., 1837-1917

Practiced medicine in Illinois from 1864 to 1872; he then moved to Nebraska, and practiced there from 1872 to 1879. Moved to Yankton, then the Capital of Dakota Territory, and practiced until 1898. Moved to Sioux City, Iowa, in 1898, and practiced there until 1903. Moved to Vermilion, South Dakota, in 1903 and continued to practice until May 25, 1917, when he died in his home of pneumonia.

He was a member of the State Medical Society of Illinois, State Medical Society of Nebraska, and the American Medical Association. Wrote the Constitution and By-Laws, and was one of the organizers of the Dakota Medical Association of Dakota Territory in 1882, and was its president for the first two years.

In 1874 he was appointed Assistant Superintendent of the Nebraska Hospital for the Insane at Lincoln, remaining until 1879. He was appointed Superintendent of the Dakota Hospital for the Insane at Yankton, Dakota Territory, remaining in that position until 1886, when he resigned to enter the practice of medicine.

He was married May 30, 1865, to Amanda J. Dillon of Springfield, Illinois, the daughter of Joshuah and Elizabeth Dillon of Springfield. Three chidren were born to this union, one son Arthur, who died at the age of eleven months, and two daughters, Mrs. T .E. Branch, Milwaukee, Wis., and Mrs. E. M. Hart, Vermillion, South Dakota.

THOMAS R. POTTS, M.D.

First President of the Minnesota State Medical Association

PROBABLY the roster of organized medicine in the state of Minnesota will contain no more luminous a name than that of Thomas R. Potts, M.D., of St. Paul, first president of the Minnesota State Medical Association.

Dr. Potts was born in Philadelphia in 1810, many years before the state of Minnesota was admitted to the Union. He passed his boyhood in Pennsylvania, and was graduated from the University of Pennsylvania School of Medicine in 1831, at the age of twenty-one. Like many young physicians of the day, the young Potts cast his eyes to the Westward, but the records show that he did not come to Minnesota until the year 1849, eighteen years after he had received his degree in medicine. Saint Paul had been settled in 1838, and by the year 1841 there was already a Roman Catholic mission with a chapel called "Saint Paul," from which the city

Minnesota Historical Society

Thomas R. Potts, M.D., 1810-1876

later took its name. Father Galtier was the priest at the mission, and the great city which now stands on the site of his rude log chapel may trace its name to his christening.

Minnesota became a territory of the United States in 1849, the year in which Dr. Potts, then 39 years old, came to Minnesota to accept the post of resident physician at the Fort Snelling military reservation. But Saint Paul was incorporated as a village in 1851, and Dr. Potts, in addition to his duties as a physician, served as first president of the town council. He entered the civic and social life of the frontier settlement with a zest and industry. In the year 1853, Dr. Potts became the first president of what is now the Minnesota State Medical Association, an office which he filled faithfully and constructively. Saint Paul was incorporated as a city one year later (1854), fully four years before Minnesota became a state (1859). In 1866 Dr. Potts was appointed city physician, a position which he occupied until 1871, when he resigned to become consulting physician for a railway company. In 1873 he was chosen health commissioner of the city of Saint Paul, a post which he held until his death in 1876, at the untimely age of 66.

Dr. Potts possessed a character which the rigorous demands of the rude Northwest seemed only to strengthen and develop. The development of medicine in Minnesota must pay tribute to this pioneer physician, for it was the practitioners of the bleak and then-trackless Northwest of 75 years ago who laid the enduring foundations of the present Minnesota State Medical Association.

Many changes have taken place in the requirements for medical practice by the State Boards of Medical Examiners. The following articles present a brief summary of the various developments and requirements:

EARLY STATE REQUIREMENTS OF THE NORTH DAKOTA STATE BOARD OF MEDICAL EXAMINERS

G. M. Williamson, M.D., L.R.C.P.&S., Edin.
GRAND FORKS, N. D.

In every country having a standard comparable to that of the United States, the National Government, through one or more bureaus, has always kept direct or close control of educational institutions and of the licensing of physicians.

The National Government, however, assumes no responsibility, regarding education for the licensing of physicians, these matters having been left by the Constitution to the individual states.

When the territory of Dakota was established and an effort made to establish law and order in this section of the country of necessity, there must be also granted a Code and Territorial laws under which to operate and we find in the Territorial laws of 1869 a clause governing the practice of medicine as follows:

Who May Practice Medicine—Code of 1869

"It shall be unlawful for any person within the limits of said territory who has not attended two full courses of instruction and graduated at some school of medicine, either of the United States or some foreign country, or who cannot produce a certificate of qualification from some state or medical society, and is not a person of good moral character to practice medicine in any of its departments for reward or compensation, or attempt to practice, or prescribe medicine or medicines for reward or compensation for any sick person within the territory of Dakota, provided that in all cases when any person has been continuously engaged in the practice of medicine for a period of ten years or more, he shall be considered to have complied with the provisions of this Act."

This held until 1885 when the following became effective:

Who May Practice Medicine

"No person shall be permitted to practice

> medicine in any of its departments in this Territory unless he be a graduate of a medical college, or unless upon examination before the Board composed of the Superintendent of Public Health and two other physicians to be selected by the Territorial Board of Health, such person shall be found upon proof to have been actually engaged in the practice of medicine for a term of not less than ten years, and no person shall practice medicine unless he be of good moral character and is not an habitual drunkard."

If a person possessed the above qualifications, a certificate was issued to him by the Superintendent of Public Health upon the payment of a fee of two dollars.

Seven hundred thirty-nine licenses were granted under territorial laws.

The law of 1885 was a step in advance of that in the code of 1869, and a better control over the men who sought to practice in the territories was obtained. Men trained in the best colleges of the East were getting control of affairs medically, and the general trend of the profession was upward. When the territory was divided in 1890, and North Dakota became a state, a new medical practice act was enacted at the first meeting of the legislature.

By this Act the Governor was given power to appoint a State Board of Medical Examiners consisting of nine members of whom eight shall be practicing physicians, graduates of reputable medical colleges. Two members of such board shall be homeopathic physicians and one a lawyer. (Here we first notice sectarianism in medicine in the state.) The law also provided for the organization of the board and fixed the time when the examinations shall be held, it also fixed the branches on which applicants shall be examined. Any person who has attended three full courses of lectures of at least six months each could apply for examination. This law was afterwards amended so as to read as follows: "Applicants must present evidence of having graduated from a reputable medical college and attended three full courses of lectures of six months each, provided however, that after the year 1904 applicants must present evidence of having graduated from a reputable medical college and attended four courses of lectures of at least eight months each. The Board also in its discretion may grant licenses for the same fee without examination to applicants examined and licensed by other state examining boards maintaining standards not lower than those provided for in this article."

This last section of the law provides for reciprocity in licenses with other states.

Up to this time no standard for a preliminary education had been fixed by law, that was left to the ruling of the Board. The law of 1911 fixed a standard of two years college work.

I am sure the profession of North Dakota will be especially interested in an account of the first meeting of the Board of Medical Examiners and to know the personnel of said Board. Three members are with us yet, namely, Dr. Charles MacLachlan, superintendent, State Sanatorium, San Haven, N. D.; J. N. Burrows, M.D., Bathgate, and J. W. Vidal, M.D., Fargo.

The following is copied from the first minute book:

"The first meeting of the North Dakota State Board of Medical Examiners was held in the parlors of the Columbia Hotel, Fargo, July 31. 1890.

"Members present: Drs. Philip, Burrows, McLachlan, Vidal, O'Brien, Logan and Mr. J. M. Cochran, who was attorney for the board. Drs. Wear and Kendrick were also members of the board. Dr. Burrows was elected president, and Dr. Logan, secretary. Rules and regulations were adopted:

> "Rule 1. An applicant for examination for license to practice medicine in this state, who is a graduate of over five years' standing before making application for such examination and license shall be considered an 'Old Practitioner' and any such applicant who is a graduate of less than five years' standing shall be considered a 'Recent Graduate.'
>
> "Rule 2. Applicants who are 'Old Practitioners' shall be required to obtain a minimum marking of not less than 65 per cent in each of the following subjects: Practice of Medicine, Practice of Surgery, Materia Medica, Obstetrics, Diseases of Women and Children; and a minimum marking of not less than 35 per cent in each of the following subjects: Anatomy, Chemistry, Physiology, Pathology, Histology, Preventive Medicine, Diseases of Eye and Ear, Medical Jurisprudence and Diseases of the Nervous system.
>
> Rule 3. Applicants who are 'Recent Graduates' shall be required to receive a minimum marking of not less than 65 per cent in each of the following subjects: Practice of Medi-

cine, Surgery, Materia Medica, Obstetrics, Diseases of Women and Children, and a minimum marking of not less than 50 per cent in each of the following: Anatomy, Chemistry, Physiology, Pathology, Histology, Preventive Medicine, Diseases of Eye and Ear, Medical Jurisprudence, Diseases of the Nervous System."

On October 15, 1896, the following motion prevailed:

"That the distinction heretofore made between 'Old Practitioners' and 'Recent Practitioners' be and is herewith done away with.

"Resolved that henceforth a marking of not less than 65 per cent on every subject and a general average of 75 per cent be required. (Carried)."

Nothing is stated in the rules regarding preliminary education.

When the Medical Department of the State University was established the Board in 1908 passed the following resolution:

> "That all applicants of 1912 and thereafter must have a preliminary education equal to that of the Medical Department of the University of North Dakota which was the completion of two years in a recognized college of Liberal arts in order to be allowed to write the examination for license in this State."

It is interesting to note that North Dakota and Minnesota were the first two states to adopt as a preliminary, two years college work, effective since 1912—since that time 38 other states have adopted that standard.

Also in 1908 the Board passed a resolution refusing candidates from Class C Schools the privilege of writing the examination for license.

At the Legislative Session of 1911 a new Medical Practice Act was enacted, effective August 1, 1911. Under this law after fixing certain definite standards, the Board is given broad discretionary power to make rules and regulations governing examinations and the issuing of licenses.

It is comprehensive and provides the safeguards considered essential by the Council on Medical Education of the American Medical Association.

First, It gives the Board control of the preliminary education requirements.

Second, With the facilities of medical schools.

Third, With examination for license.

Development of Legal Requirements for the Practice of Medicine in South Dakota

Lawrence K. Fox*
PIERRE, S. D.

APPARENTLY it was not until the eighth annual session of the legislative assembly of Dakota Territory that any attempt was made to prescribe restrictions on those who cared for the sick of the Territory. On January 9, 1869, Mr. Hampton, member of the Council from Clay County, introduced Council Bill No. 32, "A Bill for an Act to Protect the Citizens of Dakota, and to Elevate the Standing of the Medical Profession." Two days later, the bill came up for final passage, and was passed by the Council by a vote of nine to three. The bill came up for final action in the House on January 14, and was passed by a vote of 16 to 10. It was signed by the governor of the Territory on the following day (January 15), and Dakota Territory had a law specifying who might and who might not practice medicine within its borders. It is interesting to note that although punishments for violations were set forth in the Act, no board or commission was set up for the enforcement of the Act's provisions.

This Act of 1869 follows:

> Chapter 14, Laws of 1868-69. (Council Bill No. 32).
>
> 1. *Who May Practice Medicine*—Be it enacted by the Legislative Assembly of the Territory of Dakota: It shall be unlawful for any person within the limits of said territory, who has not attended two full courses of instruction, and graduated at some school of medicine, either of the United States, or some foreign country, or who cannot produce a certificate of qualification, from some state

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*Secretary, the South Dakota State Historical Society.

or county medical society, and is not a person of good moral character, to practice medicine in any of its departments, for reward or compensation, or attempt to practice medicine, or prescribe medicine or medicines, for reward or compensation, for any sick person within the said Territory of Dakota; Provided, That in all cases when any person has been continuously engaged in the practice of medicine for a period of ten years or more, he shall be considered to have complied with the provisions of this act.

2. *Punishment Prescribed*—Any person living in the Territory of Dakota, or any person coming into said territory, who shall practice medicine, or attempt to practice medicine, in any of its departments, or perform, or attempt to perform, any surgical operation upon any person within the limits of said territory, in violation of section one of this act, shall, upon conviction thereof, be fined not less than fifty nor more than one hundred dollars for such offense; and upon conviction for a second violation of this act, shall, in addition to the above fine be imprisoned in a jail within said territory for a term not less than thirty days; and in no case wherein this act shall have been violated, shall any person so violating receive a compensation for services rendered; Provided, That nothing herein contained shall in any way be construed to apply to any person practicing dentistry.

3. *Effect*—This act shall take effect and be in force from and after its passage and approval.

Approved, January 15, 1869.

This Act of 1869 was copied bodily into the Code of 1877, there being no changes until 1885, when Chapter 63 was enacted. Today it would be said that this law (1885) put teeth into the old law by creating Territorial and county boards of health. The provisions of the former law were woven into the legal fabric of the new set-up.

At the session of 1887, the law of 1885 was amended slightly. The 1885 law made the attorney-general of the Territory *ex officio* president of the board. This was changed during the session of 1887, so that a graduate of a medical college had to be appointed as board president, eliminating the attorney-general entirely. Provision was made for a board of medical examiners, and the sections of the old law which created the county boards of health were repealed. Fees for post-mortem examinations and expert testimony were fixed. This Act was approved on March 11, 1887.

The state of South Dakota entered the Union on November 2, 1889, and Dakota Territory of course passed out of existence. The Act of 1887 seems to have been acceptable enough to be carried over into the laws which became part of official state statutes, because the South Dakota State Historical Society has no record of any further legal action prior to Chapter 133, Laws of 1893.

This was a law regulating the practice of medicine. The emergency clause stated that there was no adequate law on the subject, and thus, this law was to take effect from and after its passage and approval. It was approved on February 16, 1893.

Amendments have been made from time to time since 1893, giving protection to both public and reputable members of the medical profession. Quackery has been discouraged as much as possible, but there are, inevitably, people who will invest in the "Drake estate" of purveyors of medicine.

HISTORY OF MEDICAL LICENSURE IN MINNESOTA

Julian F. DuBois, M.D.*
SAUK CENTER, MINN.

THE history of medical licensure in Minnesota is interesting in that it shows a steady progress, always working toward better service for the sick.

The Territorial Laws of Minnesota for 1851, Section 5, provided:

> "The medical societies established as aforesaid, are hereby respectively empowered to examine all students who may present themselves for that purpose, and to grant them diplomas under the hand of the president and the seal of the society; which diploma shall constitute them members of said society; and it is hereby made the duty of the censors, of each medical society, carefully and impartially to examine all medical students who shall present themselves for that purpose, and report their opinions in writing to the president of the society."

Section 6 of the same law provided:

> "No person shall be permitted to be exam-

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*Secretary, Minnesota State Board of Medical Examiners.

> ined as a candidate for a diploma and membership of any of said societies, unless he shall have arrived at the age of twenty-one years, has at least a good English education, and has studied medicine at least three years with some respectable practitioner, and can produce satisfactory evidence of good moral character."

It is interesting to note that the examination fee was $10.00 and an additional amount, not exceeding $3.00, could be assessed:

> "for the purpose of procuring a medical library, anatomical cabinet, chemical apparatus, or for the encouragement of useful discoveries in the science of medicine."

At that time it was no criminal offense to practice medicine without a diploma.

The next change in the law came March 9, 1869. Section 1 of that law provided:

> "That it shall be unlawful for any person within the limits of said state, who has not attended at least two full courses of instruction, and graduated in some school of medicine either in the United States or of some foreign country, or who cannot produce a certificate of qualification from some state, district, or county medical society, and is not a person of good moral character, to practice medicine, in any of its departments, or perform any surgical operation for reward or compensation, or attempt to practice medicine or prescribe medicine or medicines, or perform any surgical operation for reward or compensation within the said State of Minnesota."

A penalty of a fine of not less than fifty dollars nor more than one hundred dollars was provided for the first offense; and for a subsequent offense, the foregoing fine and a jail sentence of thirty days. Section 3 of the same law provided that a physician file his diploma in the office of the Clerk of the District Court in the County in which he resides or keeps his office. One studying with a preceptor was given three years from the commencement of his course of study to comply with the provisions of the law of 1869.

This law was repealed on February 24, 1870 by Chapter 47 of the General Laws of Minnesota for that year.

The first State Board of Medical Examiners was created on March 5, 1883 by Chapter 125, the General Laws of Minnesota for 1883. This law provided:

> "The faculty of the medical department of the University of Minnesota shall organize as a board of examiners as herein provided, within three (3) months after the passage of this act; they shall procure a seal, and shall receive through their secretary, applications for certificates and examinations."

This law also provided:

> "That every person practicing medicine in any of its departments . . . shall present his diploma to the examining board . . . for verification as to its genuineness. If the diploma is found genuine, and the person named therein be the person claiming and presenting the same, the board shall issue its certificate to that effect . . . . If not a graduate, the person practicing medicine in this State shall present himself before said board and submit himself to such examination as the said board shall require."

If the diploma was found to be genuine, the Board was permitted to charge a fee of one dollar, but if found to be fraudulent the board was permitted to charge and collect twenty dollars of the applicant presenting such diploma. Candidates for examination were required to pay a fee of five dollars. A person was regarded as practicing within the meaning of the act:

> "who shall profess publicly to be a physician, and to prescribe for the sick, or who shall append to his name the letters 'M.D.' "

One who violated the act was subject to a fine of not less than fifty dollars nor more than five hundred dollars, or to imprisonment for not less than thirty days nor more than one year.

The next change in the laws was on February 28, 1887, at which time Chapter 9 of the General Laws of Minnesota for 1887 increased the State Board of Medical Examiners to nine members and provided that they were to be appointed by the Governor. The Legislature for the first time provided the subjects for which the applicants must be examined. The subjects were: Anatomy, Physiology, Chemistry, Histology, Materia Medica, Therapeutics, Preventive Medicine, Practice of Medicine, Surgery, Obstetrics, Diseases of Women and Children, Diseases of the Nervous System, Diseases of the Eye and Ear, and Medical Jurisprudence. The applicant must have attended three courses of six months each. Seven members of the Board had to consent to granting a license. The penalty for practicing without a license was stipulated at not less than fifty dollars nor more than one hundred dollars, and by imprisonment in the county jail for not less than ten days nor more than ninety days.

In 1895 the legislature increased the requirements to four full courses of lectures at a school recognized by the Board. This became effective on and after January 1, 1899.

Reciprocity was first recognized by the Minnesota Legislature in 1905. Section 2297 of the General Laws provided that the Examining Board may grant a license to physicians licensed to practice by the similar board of another state.

In 1911 the Legislature authorized the Medical Board to issue itinerant licenses to physicians in addition to their regular license, on the payment of a fee of three hundred dollars. However, this authorization being discretionary, the Board does not issue itinerant licenses because the granting of such licenses is not in the best interests of the public.

Fee-splitting was first prohibited by law in Minnesota by Chapter 365 of the Session Laws of 1917, the law providing:

> "It shall be unlawful for any physician or surgeon to divide fees with, or to promise to pay a part of his fee to, or pay a commission to any other physician or surgeon or person who calls him in consultation or sends patients to him for treatment or operation."

On April 15, 1919, the Legislature provided that the State Board of Medical Examiners may, with or without examination, grant a license to any physician who has satisfactorily passed the examination given by the National Board of Medical Examiners.

In 1927 the Legislature reduced the Board membership to seven and provided that the Council of the Minnesota State Medical Association might make recommendations of three physicians for each position on the new Board. It was at this session of the Legislature that the Basic Science Law was passed. Each physician was required to register during the month of January in each year and pay to the Board a fee of five dollars a year for the first two years, and two dollars per year thereafter. The law authorized the State Board of Medical Examiners to expend this money in the enforcement of the Medical Practice Act and the Basic Science Law.

In 1928 a lawyer was appointed to carry on this work with the following results:

Investigations	326
Court cases convicted	93
Court cases pending	3
Court cases not guilty	11
Court cases dismissed	9
Court cases not indicted	2
Licenses revoked	13
Licenses suspended	1

In 1929, because of the unsatisfactory operation of the massage law passed in 1927, the licensing and supervision was placed under the State Board of Medical Examiners. Massage licenses are issued for a period of one year and automatically expire on May 31, of each year, unless renewed prior to that date. In 1929 when the Medical Board took over the supervision of masseurs, there were 269 licenses outstanding and today the total is 160.

It is interesting to note that in every change of laws since the Territorial Laws of 1851 to the present day, there has been a constant desire to give better service and protection to the sick with little or no thought given as to the effect upon the physicians.

The names of many men could be mentioned in this article, but space permits the mention of only one. Dr. Herman M. Johnson of Dawson, Minnesota, gave of his time, his wealth, and even his health. Dr. Johnson is gone, but his noble work in bettering the laws exists as a living monument to this noble man. Those who carry on can but imitate, they cannot equal his fighting honest spirit.

Our Professional Likes and Dislikes*

**Presidential address, S. B. McGlumphy, M.D., of Yankton, Dakota Territory. First annual meeting of Dakota Medical Society, June 3, 1882, at Milbank, Dakota Territory.*

S. B. McGlumphy, M.D.
Vermillion, S. D.

The older I become in the practice of medicine, the more thoroughly I am convinced of the fact that as medical men we are prone to harbor petty jealousies and to emphasize real or supposed defects in the practice and personal character of our medical brethren, than either of the other learned professions.

This abnormal course is cherished by us and even rolled as sweet morsel on our tongues, irrespective of the standing or professional influence of the regular medical faculty. We appear almost totally to disregard the old adage, "In union there is strength." The truth of this dogmatism will be more clearly shown by a few illustrations. We assemble as we have today in convention and establish a feebill, but almost before the printer's ink becomes dry on our cardboards we are induced to cut down these established charges in the vain hope of securing a continuance of patronage, without stopping to consider the fact that irregularity in charges coupled with looseness in collections, are the surest roads to professional bankruptcy that physicians can travel: yet notwithstanding this very important part of our calling, we find it practically impossible to procure a concert of action in our county or district medical societies. And in meeting our brethren in consultation, if it be an important case, these vain propensities will up within us and bias our conduct to the detriment of the attending physician, by weakening the confidence reposed in him by the patient and the patient's friends. In these cases we have the advantage of our fellow practitioner and it is with a feeling of sadness that I am constrained to say that some of us exert a studied effort to portray our extended knowledge of the peculiar bearing of all the symptoms—for weal or woe—upon the case; consequent upon this is a demand for a radical and immediate change of treatment, and if what I have suggested be faithfully carried out, the recovery of the patient will be beyond a peradventure; or, if a contrary opinion seems practicable, he observes in solemn tones, "If I had been called earlier the patient's life might have been saved;" and in conversation with the friends of the patient during the progress of the case we are very apt to drop remarks reflecting upon the skill of the physician in charge, and at the same time comment largely and profoundly upon any change of symptoms which may have occurred.

Then again, some one of us is called upon in a certain neighborhood to treat an epidemic of some disease which proves very fatal to those attacked, and we have to bear the self-mortification of burying a number of our patients. Here again crops out this same propensity to delineate similar epidemics, with flattering success in treatment and almost universal recovery. One more, if you please: some member having a case of midwifery loses the mother, and especially if the mother and child both die; then we hear reports from physicians of hundreds of cases without a single fatal accident. I might cite cases running through all the vicissitudes of a physician's practice, but it is so humiliating to portray the many other examples of our morbid likes, that I forbear.

Our professional dislikes are apparently as thoroughly infused in our daily professional intercourse. It grates upon our sensibilities to observe that a medical associate has gained a more lucrative practice than ourselves; or that by untiring zeal any of them have attained eminence in a special branch of our profession; or if they hold a public trust which we think raises them above the daily rounds of practice; or if indeed they have obtained any real or supposed vantage-ground, the ever watchful eye of criticism is scrutinizing their every action. In view of this alarming state of affairs in our beloved profession, I embrace this early opportunity at the very organization of our society, to adjure its members to keep wide of these delusive paths, and start a nucleus of reform in this society which will spread its influence throughout the Territory. It is with no small degree of pride that I express the conviction that by learning, skill and energy, the members of this part of the Territory high above the mediocrity. If we desire our profession to command respect among men, we must command a superior respect for ourselves. "A house divided against itself cannot stand," so discord in our own ranks as surely tends to pervert or destroy that higher influence which physicians are so justly entitled to. Medicine is regarded by the world as one of the three learned professions, but I inquire with all candor, do we labor together earnestly to hold it in that esteem which the dignity of the title demands, or is not the reverse true, especially in this western country, where each physician is a law unto himself? Is there not a pressing necessity, even within our own compass, for reform?

Upon this topic I beg your indulgence while I hint at a few points which might advance the interests of our society. If we desire its advancement we must step out of the small circle of self and self-aggrandizement, and widen and deepen our professional brotherly love, and with united effort proudly raise the ensign of the regular physician far above the "isms" and "pathies" which are the allies of charlatanism and quackery. Are not our interests mutual? If success crowns our efforts in healing disease, it as surely establishes public confidence in the system we practice; and to the maintenance of this confidence our united efforts and energies should be devoted; for by it our circle of practice is widened and our ambition to do the most good to the greatest number is at least partially realized.

Next to harmony of action in our professional and social intercourse is the establishment of a carefully arranged feebill which should embrace a fair and just compensation for our services, systematically graded from an office prescription to a major surgical operation; but instead of having it based upon the maximum charges it should be based upon the minimum, and below this no member should be allowed to charge, but can at his pleasure charge above this minimum fee. This, to my mind, will completely overcome the many disadvantages claimed by those opposed to fee bills as generally adopted by medical societies. It would most certainly obviate the tendency among us to cut under each other's charges, which is the strongest point raised against its adoption, though I have failed to observe that even this produces more discord among medical men than the no-fee-bill system. It would not be necessary to have these fee bills placarded upon our office walls, or printed upon the backs of our monthly statements to insure a faithful observance, for no combination of circumstances should induce us to disregard our obligation as to their observance. In regard to collecting these fees after our services have been rendered, have we not all felt our inability to pursue any course which would long induce our tardy patrons to prompt payment? There is one plan which I think it would be wise to incorporate among the cardinal tenets of our society; that is to cause this class to make satisfactory settlement with their former medical attendant before we engage to make regular professional visits either to themselves or their families.

If such a plan were adopted and carry with it the undivided strength of our society, we could successfully meet that class of persons who employ one physician as long as they can without paying him, and then seek the services of the others in their turn with the same object in view; and it would stimulate that larger class to more prompt payment who settle all other bills before they pay the doctors. The last legislature passed an act bearing upon this point which will materially aid our profession by a concert of action in successfully prosecuting such a plan. It amended that section of the Code of Civil Procedure pertaining to the exemption of personal property, so that it reads as follows: "Nothing in this chapter shall be so construed as to exempt any personal property from execution for laborers' or mechanics' wages or physicians' bills except that absolutely exempt." The act also provides that no physician shall be entitled to its benefits who is not a graduate of some reputable school of medicine or who can not produce a certificate of qualification from some state or territorial medical society. These I consider as very important steps in the right direction; the first makes it possible for us to collect from nearly nine-tenths of those who avail themselves of our professional services, and the second prohibits the impiries from collecting their fees by legal process, and thereby boldly drawing the line of distinction between the educated physicians and the quack. There is no tangible reason why we should not guard this part of our business as closely as the legal profession. They have an established usage of requiring retainers of their clients before the time of trial, and make definite stipulations with them for the remainder of their fees. But we are satisfied without any definite system to face the storms, and work while we should sleep to battle with the many diseases which afflict the members of the community in which we live, and when the time comes when we are obliged to lay off the armor and quit the ranks of active practice we find that we are poor, not because we have not done sufficient professional labor to obtain a competency, but because we failed to collect that which justly belonged to ourselves and our families.

There is another element of our calling which demands active reform in place of the dereliction of the past. It is the frequent reporting of important cases, which have come directly under our own observation. I believe the physician whose highest ambition is to advance the science of medicine and surgery cannot withhold from his brethren the results of his experience in pursuing certain lines of treatment in certain cases. Such reports are alike instructive, whether the treatment has been successful or unsuccessful—the former strengthens our faith in the means used, while the latter makes us more guarded in their use under similar circumstances. We are finite beings, therefore, our judgments as to the proper *means* to be used in the course of treatment of grave maladies are not always infallible; but if we could steadfastly pursue this course we would each year find ourselves standing upon higher professional ground. The time is past when any one physician can think that within himself is contained the whole curriculum of the medical science, for the present era of medicine has forced upon us the fact that success in our calling depends upon being intimately acquainted with each others' experience. I am of the opinion, too, that our personal knowledge of the diseases incident to Dakota Territory is infinitely more important to us in our practice than the observations of diseases derived from clinical cases in the eastern border of our country or in Europe. And the necessity of this course is further evidenced from the fact that we have no medical literature in all this vast extent of country west of the Mississippi River, but this defect felt largely by us all can in a great measure be overcome by each member carefully noting his observations and treatment of interesting cases, and embodying them in reports to this society, thus gathering together data of facts as they exist among us from year to year. I believe each individual member feels the necessity of a union of effort in order to accomplish any desired object, as well as our absolute inability to carry any weight of influence at home or abroad if we pursue the old and thorny paths of discord and dissension. Shall this society drag along aimlessly from year to year, or shall we not today arise in the strength of our professional manhood, and earnestly labor together for the attainment of the highest possible achievements? The goal is not beyond our reach, for by system in laying out our work for each future meeting, and co-operation in enriching our minds in the fertile fields for our observation, we may dig from the unbroken soil that knowledge which will add something new to the science of medicine and surgery. Much as we may individually desire these attainments, they can only be realized by a continued and harmonious co-operation. The enriching influence of such a course would not long be confined within the limits of a district medical society, but would soon shed its light upon the transactions of a Territorial Medical Association and redound to our own legitimate honor in furthering the advancement of medicine. I adjure you to exclude from your minds the idea that because our fields of labor are not located in large cities, or in the wards of metropolitan hospitals, that our reports of the nosology, aetiology, symptomatology and therapeutics of cases treated by us upon the sparsely settled prairies of Dakota, or of forensic medicine, toxicology, or climatology would be of little or no value to the profession; for that would be equivalent to saying, that we turn our backs upon the city and its hospitals, when we have passed beyond the precincts where our observations of diseases and their treatment would be of value to our medical brethren. Has the physician lost his acumen, because he has settled upon Dakota soil? And are the diseases we are called upon to treat of so little importance that our observations of them are valueless? The answer echoes from the Missouri River to the British line, no! Therefore, let every member constitute a committee of one during the next year, to carefully note the effects of certain remedies upon certain diseases, and let the light so obtained be reflected upon this society at the next annual meeting through a report.

Lastly, in the matter of writing prescriptions, I think there is to a certain extent a demand for reform. It is proverbial with laymen generally, that the medicine prescribed by the regular physician is very obnoxious to the sense of taste and not infrequently to the sense of smell, which I am sorry to say is not without foundation, in fact, notwithstanding the great advancement made by pharmacists in preparing these remedies in a palatable form without impairing their medicinal properties. I am satisfied that this is an important factor in causing people to employ homoeopathic doctors for their children, and are finally induced to take their pleasant medicines themselves, who would not otherwise be induced to try the similia similibus curanter system at all. We are fully cognizant of the fact that we are frequently called to visit children through the anxiety and love of parents, whose ailments are so slight that nature needs but little assistance to effect a speedy cure; and by the close attention to the hygienic appliances upon which this school of doctors depend so largely the less grave forms of disease at any age are more or less readily eliminated. But aside from this and kindred reasons it certainly does not detract from the dignity of the physician to employ remedies pleasing to the taste when their efficacy is in no manner affected. We should fully indorse and sustain the progress untiringly for the accomplishment of this very object.

In closing these hastily written hints, I will be satisfied if the ideas presented will assist in laying aside every weight which will hinder us from maintaining the honor and dignity of the regular profession of medicine, and stimulate each one to buckle on the armor of individual investigation and research.

History of California Medicine

John W. Shuman, M.D.

A Book Review*

GUY B. DESPAROIS, M.D.
LOS ANGELES, CALIF.

WHEN our program chairman, Dr. Elizabeth Hohl, requested a presentation of this Review, objection was entered for the reason that contacts with bankrupt realtors and victims of "frenzied building and loan finance" had cooled the writer's enthusiasm for "Sunny California." A perusal of "California Medicine" written by our fellow staff member, John W. Shuman of the adventures of the pioneer physicians so ably depicted therein has produced a recurrence of the enthusiasm. It is, then, a joy to present the memories of such stalwart medical ancestors.

The Author carries on in his own inimitable and daring style; his history is filled with romance and adventure. The theme may be here more adequately portrayed by quoting in large measure from the Text.

The Dawn

From the discovery of California in the year 1542 to the coming of the Franciscan Missionaries historians differ as to the characteristics of these savages. Helen Hunt Jackson portrayed the stalwart noble type of perfect physique, while Mark Twain referred to "those degraded savages who roast their dead relations, then mix the human grease and ashes with tar, and 'gum' it thick over their heads and ears and go caterwauling about the hills and call it mourning."

Be that as it may, we are mainly interested in Indian medicine.

Yang-Na, or Pipima, the village of the Yang Indians, was the metropolis of the great Southwest called "sunnyland." The village is now Los Angeles. Its 300 souls were in great worriment because their grand 125-year-old Hioh or ruler was very, very ill. He had the night before dined too heavily and unwisely. He had eaten everything from grasshopper soup to roasted acorns.

Frogs, not just the hind legs, the rump of a coyote, a half-dozen mice and a crow, had not been enough to satisfy his gluttonous appetite; but he had also eaten a skunk's thigh, four full-grown rattlesnakes and two small lizards. Such was the diet of these aborigines.

The chief had awakened shortly after midnight with severe abdominal cramps. His wife wanted to send at once for the seer, Dr. A. Hocus. The chief assented with fear and trembling as he had had former experiences with the doctors when afflicted with an attack of rheumatism, a common complaint in those days. He had hoped that some day he might die a natural death and be gathered to his forefathers in one piece without horrible torture.

The seer was the holy man, or barking doctor. He was the diagnostician and talked to and received answers from the Great Spirit. Sick Indians believed he had power over life and death.

Dr. Hocus, when consulted by the noble patient, had immediately begun barking like a dog which was the custom of the Indian seers. He did not cease barking until the spirits told him the location of the chief's rheumatic trouble—the left thigh of his noble patient. This seemed wrong to the patient as his pain was in the other thigh. High Priest Hocus then chanted a few of his simplest chants, contorted a bit, tried hand massage and manipulation. As prayer and the laying on of hands did not bring relief, he prescribed a hot sweat of three hours in the Temescal, an underground house in which a fire was built. After the sweat, the bather was to dash out into the fresh air and jump into a pool of cold water. This, said the wise prophet, might not cure the pain but it would prove whether the patient had the proper resistance to withstand the next treatment, to be prescribed after a consultation with the shaman, or medicine man. Drs. Hocus and Pocus were the chief moving spirits of the Yang-Na medical association.

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*Read at The Hollywood Hospital Staff meeting, April 23, 1935.

While the medicine men's stocks in trade consisted in the main of dancing, incantations and legerdemain, they had other things for the treating of disease. The Indian's stomach was the Indian medico's physiological laboratory. In it were tested out all kind of herbs. If the sick Indian recovered, the herb was given the credit. If he died, the evil spirit received the blame. For cupping, a conical wooden tube was used. This tube had many uses. One to aid the ear in listening to the sounds of the internal organs and another for concealing a spider, bug or toad. For example, after applying the tube to the body and resorting to suction, the doctor would shake from the tube's interior a lizard or snake, stating, "With this removed from your system you will recover." Great faith was placed in these doctors.

The huts of these Indians were abodes of filth and all kinds of vermin infested their dwellings and persons. Remarkable virtues, however, were ascribed to these lice in the therapeutic field, to the cultivation of which much attention was devoted. In protracted illness, Dr. Pocus prepared a cold infusion of the living pest, procured from the healthiest resident of the village and administered it to the sick one by mouth. This was a rude effort to obtain the results of a modern transfusion of blood.

Soon the paleface doctor was to come bringing the Old World's type of medicine.

Along with the assorted cargo of the missionaries and Spanish soldiers came also a veritable Pandora's box of winged and wan diseases. Against these diseases, for example, smallpox, syphilis and tuberculosis, the herbs, temescals and treatments of Drs. Hocus and Pocus were woefully inefficient.

White doctors' feet trod these beautiful shores during this period of the dawn. Pirates who touched Californian shores always carried a doctor on board. The records show that one-fourth of each "prize" was divided between the buccaneer surgeon, the mate, gunner and boatswain.

The surroundings of these pirate surgeons may have fostered crime and sin, but no petty foibles were theirs. To filling out paper blanks and health surveys they gave not a passing thought. They had terrible foes, visible and invisible, terrible men, terrible diseases, terrible tempests, heat, cold, hunger, thirst, terrible passions, greed, murder and savagery. Small wonder that stories of pirates bold and buccaneers brave have ever stirred the imagination of the youth that is in us all.

Spanish Medicine

It is of unfailing interest to the physicians of the present to realize that members of their profession played important parts in the discovery and settlement of California. History and medicine have always progressed side by side and it is impossible to give a review of the latter without recording events of the former. There is not a dull moment in the history of California, neither is there a dull moment in the history of Californian medicine.

Galvez, the royal Spanish Visitador, and Fra Junipero Serra, president of the Franciscan Missionaries in Baja, or Lower California, determined to found missions in Alta, or Upper California, at Monterey, the place Viczaino had taken possession of in the name of the King of Spain in 1603. Monterey remains unto this day the most famous in Californian history.

In 1769, two expeditions set out, one by land under Serra and Portola, and the other by sea aboard the San Carlos and San Antonia, with San Diego as their rendezvous. Among the 62 persons aboard was one Pedro Prat, M.D., a surgeon.

The day of white man's medicine in California was truly breaking. The history of California goes back to the cradle of the new Spanish province, the sword, the cross and the scalpel proceeding hand in hand and had it not been for Pedro Prat, M.D., it is probable that the projected province would have miscarried and never withstood the travail of its birth.

The coming of Dr. Prat to Alta, California, was a real event. He was the first regular or old school physician to erect a hospital and really to treat the sick and wounded men in California. He was the first resident white physician of California. He was a Frenchman, a native of Barcelona, Spain, a graduate of the University of Barcelona, and a surgeon in the Royal Spanish Navy. He held the rank of captain, and was surgeon of the 300-ton sailship, San Carlos.

As soon as Prat's bark reached San Diego, a hospital of sailcloth was constructed on the shore and there the cases of scurvy and hemorrhagic smallpox from the ships were treated. The land forces had no doctor so a veterinary treated Fra Serra's varicose ulcer en route, the same as he treated saddle galls of the mules. On arrival in San Diego, it was Dr. Prat who put the holy father to bed and treated him scientifically with rest, soothing ointments and splints.

The Franciscan padres came to Alta to cure the souls of the Indians and to make them work as Indians had never worked before. The priests left the Indian medical system for the most part alone. However, the padres were accompanied by soldiers of the King of Spain to aid in keeping the peace. Each company had its surgeon who made medical history.

Of the 225 men in the first four groups, Dr. Prat closed the eyes of ninety for the last time. So tragic was the initial baptism on the Californian shores that "punta de Los Muertos" (Deadman's Point, near San Diego) derived its name from the burial of the scurvy, smallpox and dysentery-stricken men. A similar experience was endured by the Plymouth colony during the first winter.

The closing of Prat's life was sad. After he accompanied Father Serra to Monterey, the surgeon became so demented as a result of the horrors he had been through that he was unable to sort and label the drugs he had brought along. He sickened and died in 1771, and was buried in the mission at Monterey. Pedro Prat was the first medical martyr on the soil of California.

In time there were four presidios in Alta, California: Monterey and San Francisco in the north, and Santa Barbara and San Diego in the south. The 21 missions were divided among them. Because Monterey was the capital, the surgeon resided at the Royal Presidio. Monterey was, therefore, the medical center of the province of California.

The total number of surgeon generals who carried on during the Spanish reign was ten. Of these the most eminent was Pablo Soler, M.D., who lived and practiced during and after the days of Governor Romeu. During his time the 21 missions thrived. Of him the records tell, "He made long, arduous horseback rides, visiting the presidios, and caring for the sick officers, soldiers, Indian settlers and priests." He attended Fra Junipera Serra in his last illness. The early white settlers of California were beset with illness and starvation in the wilds to which they had come. Through these adversities loomed that heroic figure of Pablo Soler, the beloved physician and great surgeon, denying himself comfort and rest to serve his fellow man. The annals of Spanish rule contain many references to his skill and unselfish deeds. Pablo Soler, as a pioneer physician, established an ideal of service which has been, for more than 100 years, an inspiration for good.

Most Spanish doctors understood the contagiousness of tuberculosis, and were energetic in their efforts to eradicate it. Prior to the discovery of the tubercle bacillus as the cause (established in 1882 by Koch), Spain and Italy were the only countries that believed the disease could be imparted from one to another. The efforts of the pioneer surgeons of California in educating the masses concerning the "White Plague" were successful so that their teachings were observed.

The years 1810-1830 marked the passing of the missions into history with their sale by the Mexican Government.

The Mexican era (1822-1846) is said by most historians to be a period of standstill. It was the period of gestation which ended with the birth of the Bear Republic and the beginning of American medicine. Of the six Mexican surgeon generals, Richard S. Den, M.D., of Dublin, Ireland, was the last, and later a founder of the Los Angeles County Medical Association, in which city he practiced until his death in 1895.

Pioneer American Medicine

It was the lure of California pioneer life that brought Richard Den to this clime from Erin, and the same lure that held him fast until he passed on in 1895. He came from Ireland in 1843 by way of Australia as a ship's surgeon to visit a brother who was a rancher in Santa Barbara. From this brother he learned that American medical history was in the making in California. From this same source he learned that from its very beginning, California was surrounded by a halo of romance and that if Cabrillo's wanderings and death on this far-away coast had been written by a Homer it would be taught in the schools as a classic. His brother vowed that history and fiction had never told a history of greater love, faith and self-sacrifice than that of Father Junipero Serra's missionary work in the Californias. Richard S. Den's visit with his brother had hardly begun before he was called to Los Angeles for a surgical consultation. There he was captivated by the charms of the little pueblo destined to become a great metropolis. Its people and the remarkable opportunities to practice his chosen profession drew him as a magnet attracts steel.

Dr. Robert Semple, later a confrere of Dr. Den's, officiated at the birth of the Bear Republic. He was a dentist and as captain in the United States Infantry, serving under Fremont, was one of the 25 soldiers who wrested from Mexico the huge strip of land then called Alta California.

Before the Bear Republic came into existence there were many odd doctors in California. There was not a corporal's guard of the "sheepskin" or graduate type of physician in the whole province of Alta. It was such a newly and sparsely settled frontier that its settlers were compelled to be satisfied with whatever was obtainable.

Northern California medical history begins with the naming of the cove Yerba Buena, later called San Francisco. The name is derived from the medical Indian herb which grew on the hillsides around the place.

In 1846 San Francisco had a population of 459, and only three real doctors. Dr. Townsend, the nestor, crossed the plains with the Stevens party, the first to cross the Sierras by way of the Truckee River, the route later followed by the train.

Dr. John W. Palmer, one of the many physicians who came to San Francisco in '49, left distinct footprints. He was city physician and wrote a book, "New and Old," giving the best medical picture of that time. Like the rest of the doctors, he believed that quinine was the panacea for all ills that flesh was heir to. When Palmer first arrived he slept on a free but flea-infested sandhill. The next day he played monte for a win, set up offices and soon was making $75 to $100 a day. Medical fees were big in those days. Two ounces of gold ($32) per visit was collected. Medicine was also expensive, laudanum selling for one dollar a drop and quinine for one dollar a grain. Dr. Palmer sold his supply of quinine at auction for $64.00 an ounce.

Many of the "'49" doctors were the pick of the land they came from, being well educated, industrious and respectable. San Diego, Los Angeles and San Francisco are still reaping rich medical heritages from the surgical giants of that period. For example, let us cite Toland, Gibbons, Sr., and Cooper. Gold alone was not the reason for their arrival in the West because they had been amassing fortunes in their own home towns.

Toland had a lucrative practice before he exchanged the comforts of South Carolina for the perils of the West. Gibbons, Sr., was a professor in Philadelphia with a large clientele before he crossed the isthmus. Cooper had already climbed the ladder of success before he left Illinois.

California, and its lure of the new, made men pull up stakes and emigrate. Of these pioneer doctors who risked perilous crossings of the ocean and land only the fittest survived, those who were energetic, persevering and shrewd.

Eventually these three doctors founded the corner stone of medical education on the Pacific Coast. What they earned from the world by genius and untiring energy they gave back a thousand-fold in ideals and gifts. The hospitals, medical schools, societies and journals are only a few of the things these heroic men founded which are still flourishing.

Many have been the changes since the arrival of the gold-fleece chasing physicians. The California Argonauts not only searched for but found the golden fleece.

When the news went out that gold had been discovered in the raceway of Captain Sutter's sawmill in 1848, thousands caught the fever. That year gold to the extent of five millions was turned out and the next year 40 millions. In 1850 the population was increased by a hundred thousand people. Prices went sky high. The price of a drink was a pinch of gold dust so bartenders with a broad thumb were an asset. The expression of "How much can you raise in a pinch?" dates from that time. Doctors collected their fees the same way when scales were not at hand. Sacramento became the medical center of the age.

Dr. Fayette Clappe opened the first office at Rich Bar in 1849, and within a few weeks' time he was one of 29 in a town with less than a thousand population. In addition to typhoid, malaria and erysipelas, frightful accidents happened to the unsuspecting miners working in the river beds from rocks rolling down the mountain sides. In one period of 24 days there were several murders, bloody deaths, whippings, a hanging, an attempt at suicide and a fatal duel. Those were stirring times. When the gold fever died down many men returned to their former pursuits of ranching, shopkeeping, manufacturing and practicing medicine. Thus many of our brothers who came here in the late forties as miners turned to the practice of medicine.

After the Argonauts, came the titanic feats of the railroad builders, the rise of Los Angeles and the planting of a new civilization on the west coast.

Los Angeles

The first American doctor to come to California, John Marsh, M.D., settled in Los Angeles in 1830, after journeying from New Mexico with a party of trappers. As his diploma from Harvard was in Latin, none of the Mexican officials could read it so he was not licensed until February, 1836, when a San Gabriel father passed on the diploma as being genuine.

Of oddities in medicine, Los Angeles has produced her share. Not only was there a dearth of good doctors in California in the forties and especially in Los Angeles, but there was an absence of things necessary to good practice, such as drug stores and hospitals. Dr. William Osborne opened the first drug store here, in 1850, and practised from there. Dr. John S. Griffin, an army surgeon, located here in 1854. He was a notable character and had much to do with the making of the medical history of Los Angeles. He was a prime spirit in reorganizing the Los Angeles Medical Association. Griffin had a warm heart but a gruff exterior. He shocked the youthful Dr. Joseph Kurtz by saying, "What the hell do you want here? There are too many of us doctors here already."

The Pueblo that was once Yang-Na boasted no sidewalks and El Camino Real was but a tortuous narrow trail when Widney, Kurtz, Orme, Edgar and Lindley joined the medicos in service to Aesculpius. Our angelic city was called the toughest city in the world by eastern newspapers. Joseph P. Widney settled in Los Angeles after graduating from Toland Medical School. He was the physician in attendance when the noted bandit Vasquez was captured. Joseph Kurtz told the following story: "One day a Mexican buccaneer offered me four boxes of cigars which he had smuggled in at 1½ cents apiece, swearing that they were real Havanas. I bought them and tried to smoke one, but it was so vile I threw it away. This morning a man came in whom I had been treating for asthma and I gave him one of the pseudo Havana cigars. He smoked it, became nauseated and was so relieved of his affiction that he bought the remainder at 25 cents apiece."

To illustrate the fraternal spirit of Doctors Henry S. Orme, an ex-Confederate walked arm in arm with bluecoat Edgar, Griffin and others. Dr. Lindley, a hoosier, was 23 years old when he walked up Commercial Street, the business district in 1875. He was interested in education, a member of the early board of education, an excellent practitioner, a medical editor of international repute, and a founder of hospitals. He served terms of superintendency in two of the greatest hospitals—the Los Angeles General and the California Hospital. He left an unparelled record. In 1851, there was a clear-cut record of aestivo-autumnal malarial fever, but it was called for lack of knowledge malarial typhoid.

In 1857, there occurred an epidemic of putrid sore throat among children, which in later years was recognized as diphtheria. Dr. Den says in his memoirs, "It was a remarkable fact that all of us remote from eastern and European seats of learning as we were, and, distant besides from surgical and medical supplies, learned to depend upon our own resources, and acquired an amount of self-reliance that carried us through. While our lives were often filled with perilous adventure in this frontier country, we were fully appreciated as to our worth and no one stood higher in the estimation our respective communities than did the pioneer physician."

History of the Medical Association of Montana

E. D. Hitchcock, M.D.
GREAT FALLS, MONTANA

FOURTEEN years after the Montana territory was formed, and eleven years before Montana was admitted to Statehood, a group of practicing physicians was called together and organized the first Medical Association. This meeting took place in 1878. The records of this meeting and subsequent meetings are lost, and we do not pick up the thread again until the summer of 1888. At the reorganization meeting in 1888, Doctor George H. Barbour was elected corresponding secretary and is the only physician now living in Montana who was present at the meeting. Let me quote from Doctor Barbour's records and recollections of that time:

"Early in the spring of the year 1888, I was invited to meet a number of Helena doctors at Doctor W. L. Steele's office. We sat around a hot stove and discussed the advisability of resuscitating the old State Medical Association, which had expired some years before. No one present apparently knew much about the cause of its demise, and what had become of its records.

After the expression of the opinion of various ones present, it was decided to call a general meeting, later in the summer, for the purpose of the reorganization of the Medical Association. I was appointed to send notices of the coming meeting to the names and addresses of the doctors, that is, the names of those that were given to me at that time and later. The date of the meeting finally was decided to be held in Helena, August 22 or 23, 1888."

Quoting the secretary's minutes of this meeting: "Secretary's minutes of the meeting held on August 22, 1888. Temporary officers elected or appointed—Dr. William L. Steele, vice-president (or chairman). Doctor W. M. Bullard, secretary." There were no other elections. The only doctor present at this meeting outside of Helena and its neighborhood was Dr. T. J. Murray, of Butte. I regard this meeting of August 22, as temporary or preparatory for the permanent organization which followed the next day, August 23, at which the attendance was greater from Butte and other parts of the state. I believe the attendance was greater at this meeting than recorded by the secretary.

The following officers were elected: President, Dr. E. D. Leavitt; vice-presidents, Dr. G. W. Monroe and Dr. W. L. Steele; recording secretary, Dr. W. M. Bullard; corresponding secretary, Dr. G. H. Barbour; treasurer, Dr. S. C. Baldwin.

Meetings of the Medical Association of Montana have been held each year since the reorganization in 1888.

Communicable Disease Control*

G. W. McCoy, M.D.†
Washington, D. C.

BY WAY of introduction, I wish to bring to your attention a report on communicable disease control emanating from a special committee appointed by the American Public Health Association. The committee preparing this report had Doctor Haven Emerson for its chairman, which is a guarantee that the work was capably and conscientiously done. The report has appeared in the Public Health Reports for August 9, 1935, and doubtless will be made available by application either to the Public Health Service, Washington, D. C., or to the American Public Health Association's central office here in New York. This report is a revision of earlier work under the same auspices and a comparison between it and the preceding reports dealing with the same subject shows how our knowledge of communicable disease control is becoming more exact and satisfactory. The report constitutes perhaps the most valuable and authoritative publication we have dealing with the subject.

In my discussion today I shall confine myself to communicable disease problems that confront us in this country, making no attempt to deal with those of an exotic nature.

Communicable disease control for the groups you are chiefly concerned with, that is college and secondary school students, naturally blends with the control measures to be taken by the community at large. There are some phases perhaps where a divergence of practice is possible because, on the whole, you have, I suspect, rather better control of your school groups than is practicable in the population as a whole.

I know you expect me to deal largely with immunization procedures since these have been my special field of interest for a good many years. May I say at the outset that I think you will find me most conservative—indeed, I have a firm conviction that we have had too much optimism in relation to communicable disease control by immunological procedures. In connection with agents used in producing immunity we always must bear in mind their limitations and dangers. Hardly any of our serums or vaccines can be said to be free from danger. The whole subject is too large to discuss fully now but, briefly, it may be said that the dangers involved may be grouped as (a) those *inherent* to the serum or vaccine (for example, horse serum reactions or rabies vaccine paralysis), and (b) those that are more or less *accidental,* an example of which is bacterial contaminations of biological products. One often must balance the advantages against the possible dangers. Let me clarify this a little by an example: One is confronted, let us say, with an outbreak of diphtheria in a school. We know that passive immunity produced by diphtheria antitoxin is effective but we also know that it is not free of danger. Not only is there the risk of the occasional fatality from anaphylactic shock but there are the distressing sequelae in the shape of the various manifestations of serum sickness, which are bound to affect a considerable percentage of those to whom any horse serum preparation has been given. So when we sum it all up we decide that passive immunization is not advisable save perhaps in very exceptional circumstances, which will be dealt with a little later.

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*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, December 28, 1935.

†Medical Director, United States Public Health Service; Director, National Institute of Health.

The problem that must often confront you in connection with injuries on the athletic field is whether or not to give tetanus antitoxin as a prophylactic. The serum is quite effective, but occasionally rather serious nervous system sequelae may follow in addition to the usual serum reactions. Influenced by the possibilities of danger of these and other serum complications, I suggest the use of tetanus antitoxin only when there is a dirty punctured wound or a definitely suspiciously contaminated superficial one. Ordinary superficial wounds and abrasions scarcely justify the risk involved in giving the serum.

Since I have mentioned the subject of anaphylactic shock, I would like to correct a very general error. It is often stated that a preceding sensitizing dose of horse serum is necessary for anaphylactic shock to be produced. The truth is, of course, that serious and dangerous reactions in man from the use of horse serum are likely to follow the first injection. In this we have an example of the fallacy of carrying over too directly the results of animal experiments to human experience.

It seems wise for the purpose of this discussion to make a division of the diseases into (1) those we can do something about, and (2) those about which we can do little or nothing.

Considering the members of the first group:

Smallpox—Vaccination against smallpox, of course, is our sheet anchor and must be given precedence over any other measure of control. At the same time, isolation of the patient is not to be ignored. Smallpox vaccination represents one of the procedures for which too much has been claimed. Administrative health officers are very prone to say, in effect, that it is wholly efficient and entirely safe. The truth is that it is neither—but it does remain by far the most effective procedure in the realm of immunology. It is effective within limitations, limitations imposed by the length of time since the vaccination was performed and by the virulence of the infecting agent. In recent years smallpox vaccination has lost much of its popularity, largely because of the existing benign type of smallpox that has prevailed in many parts of the world. With respect to the disadvantages, the following may be said: Up to perhaps ten years ago postvaccinal tetanus was a real threat to the continued use of smallpox vaccination. Thanks to the investigations of one of my colleagues, Doctor Charles Armstrong that menace has been put behind us. I am sure you are familiar with the fact that Armstrong found that tetanus developed only when dressings had been applied, and if you remember nothing else that I say this afternoon, I hope you will remember never to apply a dressing to a vaccination insertion.

We have another complication, apparently rare but often most distressing in its results. I refer to postvaccinal encephalitis. We are still ignorant as to the essential nature of this condition. I suspect this complication is overlooked more often than recognized. Coming on in about 10 days, usually after a primary vaccination, with pronounced symptoms referable to the nervous system, it is readily recognized if the possibility of its occurrence is remembered. I am sorry no such simple recommendation as has been made with respect to tetanus serves to prevent this complication. There is, however, one almost certain preventive measure and that is to see that vaccination is done during the first or second year of life. I realize, of course, that this is a long while before the individual comes under your observation.

Some rather suggestive work indicates that in routine application of prophylactic vaccination procedures it is better to use first the diphtheria prophylactic (artticularly toxid), following this with smallpox vaccination.

A third disadvantage of vaccination is the occasional development of more or less serious septic conditions. These have not been studied as carefully as the two specific complications I have memtioned.

Lest there be some misunderstanding as to my position, let me say that I am a strong believer in smallpox vaccination and I regard it as our most efficient prophylactic measure.

Diphtheria—In the fight against disease ,perhaps the second most important success has been scored with respect to immunization against diphtheria. At present the choice is between plain diphtheria toxoid to be given in two or three doses with an interval of three to four weeks between doses, and the newer refined alum precipitated toxoid given in a single dose. Health officers often ask which of these preparations should be employed, and I regret that I am always compelled to say that they must make the decision. The refined precipitated toxoid gives a very high percentage of immunity with a single injection. On the other hand, it causes local lesions that may even go on to the formation of abscesses, although, fortunately, this is rare. Two or three doses of the older plain toxoid are claimed by some very good students of the problem to give a decidedly better immunity than one dose of alum precipitated toxoid. In any event, for the groups with which you come in contact, diphtheria immunization is probably inadvisable without pre-Schick testing. I am, of course, aware that the Schick test is not an infalliable index of immunity to diphtheria. This probably can only be determined by titration of the antitoxin in the blood serum, a procedure that is hardly practicable on a large scale. As I indicated in my introductory remarks, passive immunity is not to be seriously considered excepting possibly in the case of children under five years of age who have been definitely in contact with a case of diphtheria and who can not be kept under reasonably close medical observation.

It would not be fair to leave the subject of diphtheria immunization without confessing that there have been some disappointments. A few years ago one important city in this country began a very intensive drive against diphtheria by toxoid immunization. There was a gratifying decline in cases and deaths for two or three years, which, however, in spite of continued pressure of the immunization campaign, converted itself into a marked increase in cases and deaths in subsequent years. A hasty survey showed that many of the children injected had really not been immunized, or that the immunity had disappeared. For this reason, I think we should, wherever practicable, do a Schick test after immunization ,and if necessary repeat the immunization procedure. Perhaps I need not say that isolation of the diphtheria patient and detection of carriers of virulent organisms play important roles in the control of diphtheria.

Scarlet Fever—I suppose we are asked a little oftener about what to do with respect to scarlet fever than with respect to any other infectious disease. Aside from isolation you may, in school groups, find it possible to carry on immunization by means of the scarlet fever streptococcus toxin. As you know, susceptibles are detected by a positive Dick test. The susceptibles are then immunized with increasing doses of toxin, a total of five doses being employed. To make sure that immunization has been effective, it is necessary to do a Dick test after the injections have been given. Whether immunization against scarlet fever it a practical procedure for general application may well be the subject of a difference of opinion; as you know it involves seven visits to the physician. I feel that ordinarily it is impracticable for public school authorities or other official public health agencies. I do think, however, it is something the individual physician may properly recommend to his clientele.

Typhoid Fever—Up to a very few years ago typhoid vaccine was uniformly regarded as an extremely important agent for the prevention of typhoid fever. The situation now is a little less clear cut. I can perhaps best illustrate this by saying that a couple of years ago the American Public Health Association appointed a committee to study the whole subject of the efficiency of typhoid vaccination. Substantially all of the evidence from military sources in the United States and elsewhere indicated the great value of the procedure although in the semi-military group making up the Civilian Conservation Corps I understand there have been examples of failure of vaccination to protect. When we come to the consideration of the experience of civil communities, the evidence of the importance of typhoid vaccination in the control of the disease is quite unsatisfactory. A few years ago one of the southern health officers called attention to the fact that so much typhoid was occurring among vaccinated persons that it was a question whether the procedure was worth while. Just at present I would not place it very high among the procedures for the control of the infection in civil practice. In connection with typhoid fever the detection of carriers among those who prepare and serve food is most important. Whether all such individuals should be tested for the carrier condition, or only those with a history suggesting a previous infection, is a question which health officers must decide for themselves.

Next to the common respiratory infections, perhaps acute diarrheal diseases, usually passing under the name *ptomaine poisoning, food poisoning*, or *dysentery* constitute the most common epidemics. Theoretically, they are very easy to prevent, practically not so easy. These outbreaks occur even among the personnel of the army and navy, in which organizations supervision of food and food service reaches a very high plane. These outbreaks are likely to occur wherever large groups are served in common. Usually, as you know, the infection is due to members of the enteritidis group of bacteria, acting either as living organisms or through preformed toxins. A few such epidemics have been traced to staphylococcus infections of food.

Measles—In recent years measles has been attacked by the use either of serum from convalescent patients or serum or blood from adults who have had the disease at some time in the more remote past. The evidence all indicates that for children of tender years these are valuable procedures. By properly spacing the dose of serum after exposure it usually is possible to permit the child to have a mild, practically harmless attack of the infection and yet secure durable immunity.

Tuberculosis—In discussing with friends just what subjects I should cover in my talk to you, all mentioned tuberculosis. Of course, there is no practicable immunization against this disease and I am without experience as to the other procedures that may be employed. I understand that it is necessary to warn ambitious students, especially those poorly financed, against the hazards of tuberculosis incurred by trying to work their way through school.

Many student health services are now routinely tuberculin testing those for whose health they are responsible, and x-raying positive reactors. This I am convinced results in the discovery of a certain, though small, number of cases of tuberculosis that would otherwise escape detection. This is of undoubted value to the infected individual and should afford some protection to his associates.

Venereal Diseases—I am not now concerned with the moral or educational phases of this problem. Of course, these diseases do not occur in epidemics in the groups with which you are concerned. Skilled treatment and self imposed limited segregation until the infected individual ceases to be a menace constitute about the only important measures that need to be considered at this time.

Now, let us take the group of diseases about which we can do little or nothing in the way of preventive measures: Here we find the common respiratory conditions, such as the common cold, the various entities we group under the name "influenza," poliomyelitis, and meningitis. I am aware that prophylactic inoculation has been or is in process of being tried in all of these but I am sure this type of prevention is not ready for general application. Practically speaking, the same thing may be said of lobar pneumonia although there is just a hint here that vaccination may be of some modest value.

One of my friends has suggested that I mention serum treatment of pneumonia, though it is recognized that you are not concerned primarily with therapeutic procedures. The evidence seems reasonably conclusive that early typing of the pneumococcus causing a given case of lobar pneumonia, followed by prompt administration of a potent antipneumococcus serum preparation results in a lowering of the death rate that is not to be ignored.

Meningitis—There is, of course, no immunization procedure to be considered here but whenever epidemics occur we are asked to express an opinion on the utility of examinations to detect carriers. I think such examinations are a delusion and a snare. I do not believe they constitute an effective means of controlling outbreaks. You may be compelled to do them in order to be doing something but do not expect the detection and removal of carriers to check an outbreak of meningitis.

Epidermophytosis—I am rather pessimistic about being able to do anything really worth while in connection with this usually benign infection. The condition is so exceedingly prevalent that it seems hopeless to attempt any measures of control until we have better basic information about it. I understand that the use of sodium hypochlorite foot baths before and after the use of swimming pools is regarded as of value. I confess to some skepticism as to the usefulness of this since we know so little of the resistance of the parasite to germicides, and even less as to its life history.

Let us turn now to a few general considerations: Perhaps the examination of food handlers deserves a little discussion. So far as I know, as generally practiced in this country food handler examinations are quite valueless. In civil communities they become either a "racket" or engender a false sense of security, or both. In these communities the rejections are nearly all for venereal diseases or tuberculosis, and I know of no substantial evidence that the exclusion from the food handler group of individuals suffering from either of these conditions has any appreciable influence on the prevalence either of tuberculosis or venereal disease. Under some conditions the problem may be a little different. If an institution is equipped for complete physical examinations and the related laboratory tests, doubtless some infections might be prevented. I judge this might be possible for a student health service;

whether it is practicable, each of you must decide for himself. Whether it would be worth the time and effort involved, I am unable to judge. I confess that food handler examinations have fallen very much in my estimation since I began to pay serious attention to amoebic dysentery. This is a disease which ordinarily is thought to be conveyed by carriers among food handlers. I doubt that this is the most important means of the spread of amoebic dysentery but even if ultimately it proves to be so, what are you to do about it? Anywhere from five to 10 per cent of the population are carriers and, practically, the problem of dealing with them is beyond public health organizations of today. If I had a choice between food handler examinations and careful observance of hand washing after the use of toilet facilities (I refer now to *the control of amoebic dysentery*) I would certainly prefer to depend upon the latter.

A discussion of communicable disease control ought at least include mention of disinfection. The old procedure of terminal disinfection by means of sulphur dioxide or formaldehyde gas has practically disappeared. Possibly on occasions the use of these agents indirectly served a useful purpose because after their employment it is necessary to thoroughly ventilate the rooms treated in order that they may be freed of evil smelling gases. This practice of terminal fumigation was followed by an era of the use of liquid disinfectants on bedding, furniture, and utensils. This has been replaced very generally by the following procedure. I quote now from the authoritative publication I referred to at the beginning of my talk. In this it is stated, with reference to disinfection after diphtheria, "At the end of the illness thorough airing and sunning of the sick room with cleaning or renovation . . . ." On the other hand, disinfection during the course of the infective disease has risen in the estimation of health officers. From the same source, and with reference to the same disease, I quote: "Concurrent disinfection of all articles which have been in contact with the patient and all articles soiled by discharges of the patient . . . ." These are the current, generally approved doctrines in respect to terminal and concurrent disinfection.

The procedures I have just briefly discussed relate to inanimate objects as carriers or infecting agents. As you know, the whole trend in recent years has been away from this view and towards one that regards rather direct contact with infected persons as the essential factor in the spread of the ordinary communicable diseases. I introduce in this manner a statement of the importance of healthy, or relatively healthy, carriers of disease organisms. Our knowledge of the role of carriers in the spread of infection is still fairly sketchy with respect to many diseases. So far as prophylactic measures are concerned, typhoid and diphtheria may be considered as often caused by carriers and the recognition of carriers in connection with these diseases is relatively easy. Appropriate measures may be taken once a carrier is detected. Beyond the established role of carriers in the two infections mentioned we have little helpful information. Doubtless the carrier is important in scarlet fever but the means of detecting the carrier state here are hardly adapted to general application. I think this is especially true in reference to release from quarantine of cases of scarlet fever. It is easy enough to detect hemolytic streptococci in terminal cultures but very difficult (impracticable on a large scale, I think) to prove that a given hemolytic streptococcus is causative of scarlet fever.

The period of quarantine of those sick of communicable diseases is generally established by hard and fast rules of official health agencies. The tendency, in general, is to lessen the severity of quarantine measures. Thus, we find the time honored six weeks in scarlet fever reduced to three weeks from onset. Where an exact means for determining the infectiousness of the patient is available, as in relation to diphtheria and typhoid, laboratory tests should guide us rather than an arbitrary time interval.

The immunization status of those coming under your supervision is of importance. The minimum, of course, is evidence of successful vaccination against smallpox. Just how recent this should have been is a debatable question. Personally, I have a feeling that two successful vaccinations ordinarily will protect an individual throughout life, save possibly in the face of a highly virulent epidemic. Beyond information as to immunity against smallpox it would be desirable to know whether an individual is suceptible to diphtheria and to scarlet fever. In these diseases the information will aid in making a diagnosis in doubtful cases and guide you in advising immunization against the two diseases.

The Tuberculosis Facilities at Sanator

A. S. Rider, M.D.
Flandreau, S. D.

I HAVE just returned from a visit to Sanator, the South Dakota hospital for the treatment of tuberculosis. My purpose was to obtain first hand information concerning the problems of that institution.

Sanator was established in 1911. It is beautifully situated in the Black Hills near Custer. Its capacity is 192 beds, and there are now 183 patients. My visit gave me a favorable impression of the efficiency, energy and interest of the staff. The rooms were clean and orderly. The meals were excellent and the morale of the patients all that one could expect. Those whom I saw were cheerful and hopeful. The original purpose of Sanator can be best-stated by quoting from the statutes regulating admission:

"No patient shall be admitted to the Sanitarium except those afflicted with pulmonary tuberculosis in the incipient state and who show reasonable probability of satisfactory improvement by treatment therein."

How far the institution has wandered from the original purpose will be plain from the following report: Fifty per cent of the patients are classified as moderately advanced, 40 per cent far advanced, 10 per cent incipient. Experience has shown that half of the incipient cases prove to be non-tuberculous. In fact, therefore, only five per cent of the patients fall within the provision of the statute.

Sanator contains now 69 patients who have been there for less than 6 months; 27 patients for 6 months to 1 year; 21 patients for 1 to 2 years; 20 patients for 2 to 3 years; 4 patients for 3 to 4 years; 3 patients for 4 to 5 years; 7 patients for 5 to 6 years; 13 patients more than 6 years; and 2 patients more than 11 years. There are 21 school teachers; 19 females and 2 males. During the past month there have been 16 admissions and their classification gives the same proportions. I saw films of three cases admitted during the week that represented far-advanced and hopeless tuberculosis.

It seems to me that this unfortunate condition has been brought about by the use of the term "*incipient*." While it is true of tuberculosis as well as other diseases, that early recognition is of great assistance in treatment, it is equally true that incipient tuberculosis may be and often is hopeless, while advanced tuberculosis may be and often is, by proper treatment, amenable to arrest and symptomatic cure.

Admission to Sanator is obtained through a board composed of county judge, state's attorney and a local medical examiner. The superintendent of Sanator has the power to reject upon application but if he admits a patient, that patient can be removed from Sanator only by cure, his own wish, or because of a major violation of the rules or by death. Local boards have been, and are, unwilling to close the door of hope against applicants for treatment and have in the original application, listed cases as incipient, that were, in fact, advanced. Such cases have been accepted at the institution for similar reasons.

The treatment of tuberculosis has made great progress since 1911. At that time, bed rest, fresh air and proper food were deemed the essentials of treatment. The doctor's position was a rather passive one. He watched the progress of his patients guided by temperature, weight and a speculative stethoscope. Now with modern X-ray technique, the changes in the lung can be visualized and a blue-print made of the treatment. The physician's role is an active one. Collapse therapy, eliminated as superfluous has made possible an active and effective attack upon the disease. One can see the improvement as it developes just as one watches a house grow in the hands of the builder.

It will be argued that it is desirable to care for the advanced and hopeless cases for the purpose of protecting the families and home communities from infection. There can be no question that such measures are highly desirable. That, however, is not the purpose for which Sanator was designed. Its entire facilities are hopelessly inadequate for any effective segregation. It is conservative to estimate that there are 10 open active cases for every annual death. That means that South Dakota, with her 250 deaths per annum, has at all times 2,500 open active cases of tuberculosis scattered throughout the state. It is plain that Sanator as a means of segregating sources of tubercular infection would be nothing more than a futile gesture, were its entire capacity devoted to that purpose. The mission of Sanator is the treatment of hopeful tuberculosis. Every bed occupied by hopeless cases, or cases that could be cared for at home, means that a like number of hopeful cases will be unable to obtain treatment.

The problem of handling advanced tuberculosis is important and pressing but it has nothing to do with Sanator and does not belong to this discussion. The statute provides that Sanator is to be for incipient tuberculosis. The records of the institution show that 90 per cent of its patients are advanced and five per cent non-tuberculous.

A taxpayer's suit might be instituted that might restrain county commissioners from paying for patients that were not incipient. The records of the institution would provide the evidence.

It seems to me that Sanator should be rededicated to its former mission, that is, the treatment of hopeful tuberculosis: First—That the statutes should be changed, and the words "in the incipient state and" deleted. It would then read "no patient shall be admitted to the Sanitarium except those afflicted with pulmonary tuberculosis who show reasonable probability of satisfactory improvement by treatment therein." This, I believe, would correctly interpret the purposes of its founders. Second—That the staff of the institution be allowed to admit patients for a trial period in order to determine whether or not they are amenable to treatment. Third—Cases not amenable to treatment and cases that can be cared for at home (such as collapse cases needing only refills) should be dismissed from the institution that beds may be had for the treatment of patients that are amenable to treatment. Fourth—That there be a time limit of six months with the requirement that further treatment and care would depend upon the recommendation of the superintendent, with a detailed statement of the benefits obtained and the prospect for further improvement. Fifth—That these proposed changes be not retroactive; that is, that they apply only to admissions subsequent to the changes in the statute covering admissions.

Case of Thrombosis of Heart*

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MRS. K., age 52, entered Douglas County Hospital May 10. She was operated upon May 14, and died May 24. She complained of painful, tender areas between the shoulder blades, fever, and aches throughout body. Present complaint began with a small pimple about May 5, which enlarged gradually with increasing tenderness and firmness. This is a typical history and course of a carbuncle in that area.

She gives no history of any serious infectious diseases, in fact no history of any illness whatsoever. She has been able to do her own housework up to the onset of the present complaint. She is the mother of four children and has passed the climacterium without any trouble.

She is well developed and nourished. Her head, chest and abdomen all exhibit normal findings. Extremities are likewise normal. Back, between shoulder blades up onto the neck, a widely indurated, firm, non-fluctuating, red area, almost leatherlike to touch, is found. Temperature when first seen 101°; pulse, 100; leucocyte count, 17,000; urinalysis, normal; Blood pressure, 120/80; blood picture, normal

On May 10, when first seen, the patient was sent to the hospital because of septic condition and marked soreness of back. The usual internal medications were administered with continuous hot fomentations to the carbuncle. On the 14th of May, the patient finally subscribed to having the carbuncle opened. Under gas oxygen anesthesia, crucial incisions were made, extending beyond the indurated area into normal tissue. A large quantity of purulent material was evacuated and vaseline gauze was packed under the flaps to allow free drainage.

Following the incision of the carbuncle, the patient had a few stormy days, but at the time of her death she was showing very little evidence of the presence of any infection. The temperature had reach that of normal and the patient was getting along so nicely that the day before her death she was anxiously laying plans for her return home. Healing of the wound progressed quite normally.

On the morning of the 24th, the nurse was informed that the patient had a good night and felt comfortable. Half an hour later the nurse was suddenly summoned to the patient's room when she complained most distressingly of a feeling of impending death. She cried out because of excruciating pain in the cardiac area, complaining of shortness of breath and nervousness. In short, she was convinced dissolution was imminent. Prompt treatment was instituted: caffeine sodium benzoate, diaglen, morphia, etc., and while receiving these emergency treatments she was in an oxygen tent.

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*Presented at the Douglas County Hospital Staff Meeting, and also at the Park Region Medical Society.

It was difficult to obtain any satisfactory picture of her physical condition as it was apparent that the end was at hand. The pulse was thready and a good part of the time the patient was pulseless, blood pressure of course was indeterminate most of the time; just as soon as the patient was removed from the oxygen tent she collapsed. Her condition was hopeless throughout the day and she died about 5 o'clock in the evening.

The first impression of this catastrophy was that we were dealing with a cardiac thrombus, (unlikely coronary). It could also have been a pulmonary thrombus. It was likely not the latter as the disturbance seemed to be confined to the vascular system, with a thready and often nonpalpable pulse, pre-cordial pain, cyanosis, but the absence of the really excruciating pain of coronary thrombosis, and absence of symptoms of an abdominal upset which so often accompany coronary thrombosis made the diagnosis of coronary thrombosis questionable. But the final conclusion would really have to include involvment of the heart.

Post-mortem examination of all abdominal organs revealed fairly normal conditions. Examination of the lungs and pleural cavities likewise exhibited no pathology. However, the heart seemed to be the seat of the trouble. The left side of the heart was normal and contracted with a very small amount of blood in its cavity; the walls were thickened. In the right ventricle there was an organized clot of unusual size and location. The clot measured approximately six inches in length and one quarter inch in diameter. It was lodged and doubled upon itself, protruding into the auricle, held in situ by the tricuspid valve.

The clot was organized[1] and hence formed somewhere in the large veins outside of the heart. The principal source of such a large clot would seem to be that of the iliac veins, and the suddenness of the symptoms places a definite time when it entered the heart. Death would have occurred within a few minutes without administration of oxygen. This reveals how small an amount of blood is necessary to flow through the heart when oxygen is administered to maintain life.

The cause of the thrombus is unsolved, but in all probabilities it formed in the iliac vein, due to stasis, and, when the patient became more active through her recovery, the clot became dislodged and was carried by the blood stream to the heart.

Bancroft's[2] article on post-operative thrombosis and emboli is apropos and his suggestions should be incorporated in our post-operative procedures: that more effort be made to provide venous blood return by systematic deep respiratory exercises, exercise of the extremities, no pressure over the wound, and hyperventilation of the lungs following every and all general anesthesia.

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The Present Status of Irradiation Treatment of Cancer With Particular Reference to Carcinoma of the Uterus

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THE treatment of carcinoma of the uterus with surgery has been almost entirely superseded by irradiation therapy. Surgery may still be considered in the earliest cases of carcinoma of the cervix while the disease is still limited to the portiovaginalis, and in the early adenocarcinomas of the corpus uteri. If surgery is to be considered in these early cases, preferably only in cases of carcinoma of the fundus, it should be preceded by a complete course of irradiation therapy. Even these early cases can be treated just as effectively with carefully administered irradiation therapy alone. The use of radium for the cervix and corpus can be expected to take care of the cancer in only a small circumscribed area—within a five centimeter radius and no more; therefore, it is necessary to

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supplement the radium treatment with external irradiation. I will not attempt to discuss the relative merits of x-ray and radium in this paper. The use of the six, eight, and ten hundred thousand voltage x-ray machines, and the use of the two, four, and six gram radium packs are still in the experimental stage.

Only 10 to 15 per cent of these cases are seen in the early stage. However, according to Max Cutler, it is impossible to determine with certainty the exact extent of the disease, so he advises the treatment of all para-uterine tissues as being potentially malignant.

In considering surgery, the complete radical operation of Wertheim has a high morbidity and mortality rate, but any lesser operation is followed by a fatal recurrence in 100 per cent of the cases. A panhysterectomy for carcinoma of the fundus gives a 60 per cent five-year cure, but these patients usually have some debilitating disease that contraindicates operation. According to Ward, in competent hands, irradiation therapy gives results in the advanced cases fully equal to the five-year results of surgery in operable patients. The primary mortality rate is two per cent for irradiation therapy as compared with eight per cent to 17 per cent for radical surgery. For all cases of cancer of the uterus, irradiation therapy has given a 25 per cent five-year cure rate: 75 per cent to 80 per cent five-year cure rate in early cases where the lesion is well localized as compared with a 15 per cent to 20 per cent five-year cure rate for advanced cases.

The judicious use of irradiation therapy requires technical skill, experience, and clinical judgment if satisfactory results are to be obtained. These facts are not universally appreciated by the medical profession. Many physicians regard this type of treatment as a technical procedure, or as a prescription that can be filled by a technician under the general direction of a physician who is unfamiliar with radio-activity. Unfortunately, we can not give a dose or two of x-ray and wait to see what happens; once the treatment is undertaken, the complete course must be carried out in order to obtain certain desired results. A faulty initial treatment may rob the patient of her only chance for a cure, because an inadequate treatment can not be corrected by a future supplemental course. If too great a dosage or insufficient filtration is used, the normal tissues will be destroyed; and, if too small a dose is used, all the cancer cells will not be destroyed. Regaud once said, "It is necessary to have much experience in order to obtain from this method of treatment all the good that it may give without the evil that it can do." It is, therefore, necessary to outline some of the basic principles underlying the treatment with deep x-ray.

Biological and Physiological Principles

The close alliance of the normal and the pathological tissue reactions and the clinical problems with the physical properties of irradiation and their application is most essential. It is evident that the structure, cell life, inherent properties, and mode of reproduction of cancer tissue are of extreme importance in guiding the radiation responses noted in these tumors. We feel that the effect of radiation is essentially a direct action of the rays on the cancer cells.

In order to arrive at the most efficient technique for irradiating a given tumor; we must consider the response of the tumor, the tissues around the tumor, the skin, and the general effect on the individual. We endeavor to deliver to the deepest part of the tumor that dose which will have a cancericidal effect on all tumor cells.

It has been established by Martin and Quimby that the tumor dose for squamous carcinomas must be at least eight to ten erythema doses. We attempt to reach this goal. The total cutaneous dose has to be much greater than the depth dose and in carcinomas of the uterus, the skin receives about a 50 per cent greater dosage than the tumor itself receives. For that reason, we employ six or eight fields, referring to the isodose charts in order to calculate the depth dose as compared to the skin dose. The epithelial desquamation should be effected without laying bare the dermis or corium. In other words, only the superficial layers should disappear. Cutaneous radio-epidermitis of the abdomen should be non-exudative.

Coutard has emphasied that the reactions of the vasculo-connective tissue surrounding the tumor are important factors in obtaining proper tumor response. Tumor regression is dependent upon the preservation of the medium in which it is growing in order to have its nutrition maintained during irradiation. He further theorizes that cellular radio-sensitivity, which seems to be linked up not only with the youthfulness of the cells, but also with the activity of their interchanges with the vasculo-connective tissue, is modified, often diminished, and sometimes suppressed. Regaud pointed out in 1929, that if non-lethal doses of radiation are applied at frequent intervals over long periods of time, normal tissues are sensitized and cancer tissues become resistant or immune to radiation. The connective tissues may be modified by an excessive total dose, or intensity per minute, by the field being too large in relation to the dose, and by inadequate filtration or tension.

The irradiation effect on the radio-sensitive embryonic tumors is direct, immediate, and occurs before the modifications in the connective tissue take place and reduce the sensitivity of the embryonic cells. This is in striking contrast to its indirect and latent effect on the well differentiated, radio-resistent tumors. In the latter group of tumors it is essential to maintain an unmodified tumor bed. The only cells that are affected early in this group are those which are in mitosis. The less differentiated cells disappear in about seven weeks after beginning treatment, and that more differentiated, radio-resistant cells regress in about three months. But if this connective tissue is altered sufficiently, the disappearance of the differentiated cells does not occur. It is therefore, easily understood why it is so essential to understand and apply these basic principles in the usage of irradiation therapy.

Radiation Activity

During the last two decades the technique of irradiation has been changing and today we have arrived at several different forms of delivering massive doses of x-rays into the tumor area. In some instances the given technique is quite efficacious, in others the results have been far from gratifying. One can go into almost any clinic in America and find a different technique or a modification of some standard form being used. We feel that this variation is due to the misinterpretation of the problems confronting irradiation therapists. One must give a dose in such a manner that it will be cancericidal and yet neither reduce the radio-sensitivity of the tumor, nor alter the tumor bed.

The massive or cancer dose given in the German clinics was not effective because the tumor received only 100 or 125 per cent skin erythema dose. It has been noted, clinically, that every cancer cell cannot be destroyed by a single massive dose of x-rays.

Pfahler's saturation technique has been an excellent step forward. He aims to deliver into the tumor a full erythema dose as rapidly as the patient's general condition will tolerate, then to keep the irradiation value in the tumor tissue up to the saturation point of an erythema dose during a period of three or four weeks. He advises against giving more than 300 per cent erythema dose through the abdominal subcutaneous tissues, because of its rather poor blood supply.

The crux of the Coutard technique seems to be the maintenance of an intact vasculo-connective tissue and the maintenance of the sensitivity of the cancer cells. If such conditions can be preserved, he attempts not only to increase the amount of x-ray delivered, but also to carry on the treatment over a long enough period to kill all the cancer cells. He found that the chronologic limit of the treatment, the limit beyond which the cancer seemed to become insensitive, was not fixed. Changes in the connective tissues resulted more from excessive daily doses and high intensity per minute than from the excess of the total dose. Radio-sensitivity was longer preserved when the daily doses were weaker, and when the duration of the treatment was longer, provided that the daily doses were not less than the threshold dose necessary for the disappearance of the cancer cells.

The time factor is most important in the distribution of irradiation so that it will serve as a protective mechanism for the connective tissues, and for the radio-sensitivity of the tumor cells. It is not quite so important in the embryonic radio-sensitive tumor which responds by being destroyed in 18 to 25 days, but it is imperative in the final regression of the most differentiated carcinomas. In order that the x-ray action which is indirect, slow, and late in the radio-resistant tumors may have its effect, the energy delivered each day must be minimal, and must bring about the slow evolution and maturation of the cancer cells. If the energy delivered is too great then the connective tissue is damaged and the evolutionary process may fail to take place.

Clinical Aspect

Before beginning treatment, the usual physical examination and laboratory analysis must be completed and reviewed. Roentgen films should be made routinely of the chest and of those bones in which there is tenderness, in order to rule out distant metastases. However, x-ray films of the bones may not show any evidence of defect radiologically in early bone metastases. Such painful metastatic bone lesions respond exceedingly well symptomatically, to palliative deep x-ray. The temperature curve is important in detecting the presence of a pelvic infection. Pyuria is also quite significant as it may mean either involvement and partial ureteral obstruction, or extension into the bladder with superimposed infection. If there is a marked anemia, it should first be treated with blood transfusions.

When syphilis complicates carcinoma of the uterus it should, of course, be adequately treated in order to obtain satisfactory results in the treatment of the cancer.

One's general impression of these patients means a great deal. If their strength is good, their loss of weight not great, they should be able to endure this more or less strenous form of treatment quite well.

The pelvic examination should reveal in a general way the clinical stage of the disease. We usually classify the condition in three stages: Stage 1. Lesion localized to the freely movable uterus—early. Stage 2. Infiltration into the broad ligaments or vagina with slight or no mobility of the uterus—advanced. Stage 3. Invasion of para-uterine tissues, pelvic organs, and possibly distant metastasis—far advanced.

A biopsy and microscopic histological study of the lesion of the cervix or uterine curettings must be obtained before starting any sort of treatment on a suspected malignancy of the uterus.

One must determine, as well as possible, just how much infection is present. Sometimes this can be determined best under anesthesia after a Hegar dilator is inserted into the uterine canal. However, in many instances a pelvic cellulitis or abscess may exist, the manifestations of which are oftentimes difficult to diagnose. If we are suspicious of an infection, deep x-ray is given prior to the insertion of the radium applicator.

The method of starting the treatment with deep x-ray has been advocated by Healy, who feels that these lesions are usually complicated by an infection. Such infected foci are neither favorable nor desirable sites for radium application. Thus, the primary lesion and adjacent tissues are prepared by external irradiation so that they are in a much better condition to respond satisfactorily to radium application. Furthermore, this is a most satisfactory initial attack when there have been profuse hemorrhages, or when the tumor obstructs the cervical os, so that the radium applicator cannot be inserted. The external irradiation controls the hemorrhage and causes enough regression of the tumor so that access may be had to the uterine canal.

Technique

As Quick has stated, there are various factors, any one of which may be varied in the principles underlying the Coutard technique. One of the primary underlying prerequisites for a successful course of treatment without accidents is to examine the patient carefully every day. One should note the patient's general condition, the temperature, the weight, the blood count, the urinalysis, and the condition of the skin.

The actual treatment cannot be carried out routinely for all patients, but must be individualized. Whenever possible, we like to apply a uterine applicator of two 25 milligram radium tubes in tandem for from 2,500 to 4,000 milligram hours. In addition, the cervix and paracervical tissues are treated with a colpostat, using three 10 milligram tubes; one to the cervix, and one to either adnexal region. In some cases a mushroom applicator may be applied to the uterine canal and cervix, with 10 milligram platinum filtered radium needles inserted into each adnexal region. We usually give from 2,500 to 4,000 milligram hours to the cervix and para-cervical tissues. The radium application usually continues over a period of six days.

We then begin a course of deep x-ray therapy immediately. The para-metrial structures are usually irradiated through two anterior, two posterior, and sometimes two lateral portals. The voltage is 200 kilovolts; the filtration, one millimeter copper; five milliamperes; distance 60 to 70 centimeters; eight to ten Roentgen units per minute; skin portals ten by ten centimetors up to 14 by 14 centimeters. The patient is treated in two seances daily, giving approximately 125 to 200 Roentgen units at each seance. The total Roentgen units per portal are carried as high as can be tolerated, depending on the condition of the skin. This varies from 1,500 to 2,500 units and sometime 3,000 Roentgen units per portal. The depth dose is calculated from the iso-dose charts. The entire cycle is usually given over a period of three to six weeks.

Complications

Infection is one of the most serious complications and may be guarded against by proper observation of the patient. The mortality from irradiation treatment for carcinoma of the cervix is due almost entirely to this factor. Proctitis, cystitis, and vaginitis are usually temporary and not severe.

In advanced lesions of carcinoma of the cervix, vesico-vaginal and recto-vaginal fistulae may develop as a result of the extension of the disease rather than irradiation. If irradiation is the causative factor, it is due to improper application of the radium. As the cervical tumors regress, stricture may sometimes develop at the os, which may be subsequently complicated by improper drainage and pyometria. This may be guarded against by frequent examination and, if necessary, gentle dilatation of the os.

Prognosis

The factors which determine prognosis in carcinoma of the cervix are multiple. The clinical stage of the disease, and the radio-sensitivity of the tumor are believed to be the most important factors in the prognosis when irradiation is employed. Max Cutler has pointed out an important relationship between structure and prognosis in cervical carcinomata under radiation treatment. Potential malignancy of a given case of carcinoma of the cervix may be determined with reasonable accuracy by a study of the histological structure. The three histological grades based on degree of anaplasia corresponds to similar grades of radio-sensitivity. The greater radio-sensitivity of the more anaplastic tumors will give a higher percentage of cures with irradiation therapy as compared with unfavorable surgical results.

Follow Up

One of the most important responsibilities of the physician who treats cases of cancer is to follow each case rigidly. After a course of deep x-ray has been completed and the patient has been discharged, it is necessary to see and advise that patient at weekly intervals for the first two or three months; after that, to see the patient monthly for six months. After the first year, one should endeavor to examine the patient every three months for the next two years. Subsequently, that patient must be seen every six months for the rest of her life.

Conclusion

Satisfactory results with this type of treatment will be obtained only by those physicians who are familiar with the basic biological and physiological principles involved, who apply these basic principles to the radiation activity, and who follow their cases closely.

The Problem of Increase in Exercise in Pulmonary Tuberculosis

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FOR some time the belief held at this sanatorium has been that a lesion of the lungs which showed, on the x-ray, a retrogressive change (increased fibrosis or resolution) was more likely to become activated than one which was stationary. Because of this belief, it became a working rule with the members of our staff that no patient was to have an increase in his activities until his lesion became stable. This rule was followed carefully for a time by all members of the staff, and some physicians still adhere to it. It will be seen, however, in our study of 155 unselected cases that exceptions have been made which resulted in the patient's activities being increased in less than three months after x-ray. (Most patients were x-rayed at three-month intervals.)

Therefore, a question of policy arose: Was a physician justified in increasing a patient's physical activities in the face of a healing lesion or should the patent be held as he was in regard to his activities until the lesion was stationary? This study was undertaken in an attempt to settle the question.

This question is of economic importance to the patient as well as to the sanatorium. It is also of some importance from a medical point of view. Patients have often been kept in bed many months because the x-ray film showed a slowly resolving lesion or if they already had a given amount of exercise and the x-ray film showed slight evidence of fibrosis, their exercise was not increased until after the subsequent x-ray. If this too showed improvement, no change was made. One of the results has been that we have kept patients in the sanatorium who might otherwise be considered ready for discharge simply because the x-ray taken just before the proposed date of discharge showed the lesion to be improved when this film was compared with the preceding one.

The material for this study was gathered from the x-ray files late in 1931 and early in 1932. It consisted of a series of cases whose x-ray films were interpreted by our roentgenologist as showing either an increase in fibrosis or evidence of resolution. One hundred and fifty-five cases were used.

A year and one-half later these cases were studied with reference to stage of disease, physical activity, clinical progress, and condition on discharge. As we were primarily interested in the rule which dealt with the advisability of changing the amount of activity in the face of an unstable lesion as shown on x-ray film, we paid particular attention to the amount of exercise our patients had at the time of the improvement in the x-ray, and also to the subsequent changes in their exercise. We found that the amount of physical activity the various patients had at the time of their x-ray improvement varied from none to several hours daily.

Patients are worked up to definite amounts of exercise in accordance with the regular sanatorium procedure. All patients admitted to the institution are at first required to stay strictly in bed. Following a period of bed treatment which, of course, varies with the individual, their activities are begun. The first step in this gradual working up toward exercise is the use of a wheel chair for short periods of time. After the patient has had this privilege for a number of weeks, and there are no contra-indications, further activities are granted. These include the bathroom privileges which are added one at a time with a few weeks usually intervening. Still later, meals in the dining room are permitted, and after that, walking exercise, school work, and work about the sanatorium.

It seemed advisable to divide our cases into five groups dependent upon the interval of change in their activities. Group "A" consisted of 84 patients, or 54.1 per cent, who had their exercise increased in less than three months after the x-ray had shown improvement. Group "B" consisted of 43 patients, or 27.7 per cent, who had not had any increase in exercise until a subsequent x-ray was taken three months later, and if this x-ray showed improvement, still had had no change in their activities. Group "C" was made up of 5 cases who were found to have tuberculosis after they were employed here. Three had pre-existing lesions while two developed small lesions. All were allowed to work full time under observation. Group "D" consisted of seven patients who showed a retrogressive lesion in one part of their chests and progressive lesion in another part. In this group, the physical activities were increased in less than three months. Sixteen cases who had no changes made in their activities were classified separately as Group "E" because they were strictly confined to bed during this time.

Groups "A" and "B" are the most important ones in throwing light upon our problem, both because of their size and because of the manner in which the patients were treated, i.e., one by increasing the exercise in less than three months, the other by being treated in the so-called routine manner. We, therefore, further analyzed these two groups. Table I shows them analyzed according to their admission classification, and from the stand point of extent of lesion, these two groups are about equal. If anything, group "B" with fewer moderately advanced and far advanced cases would be the more favored group.

TABLE I
EXTENT OF DISEASE ON ADMISSION TO SANATORIUM

	Group "A"	Group "B"
Minimal	3 or 3.6%	5 or 11.6%
Mod. Advanced	37 or 44.0%	17 or 39.5%
Far Advanced	44 or 52.4%	21 or 48.8%

Table II shows the classification of these two groups at the time of discharge, if the patient had been discharged, or their physician's classification at the time of this study. It would appear that group "A" with 88 per cent of the cases improved or better shows up in a more favorable light than group "B" which had only 74.5 per cent improved or better.

TABLE II
CLASSIFICATION AT TIME STUDY WAS MADE OR UPON DISCHARGE IF PATIENT HAD BEEN DISCHARGED

	Group "A"	Group "B"
Arrested App. Arrested Quiescent	34 or 40.5%	14 or 32.6%
Improved Improving	40 or 47.6%	18 or 41.9%
Unimproved	6 or 7.1%	6 or 14%
Died	4 or 4.8%	5 or 11.6%
Total	84 or 100%	43 or 100%

As collapse therapy is an important factor in the treatment of tuberculosis, we studied these two groups with that in mind and found that 28.6 per cent of group "A" had collapse therapy as compared with 55 per cent of group "B". If there are any advantages to be gained from this form of treatment, and we believe there are, group "B" was the most favored.

Pulmonary tuberculosis, as is well known, is characterized by remissions and exacerbations, and we felt that it was advisable to study the number of exacerbations which the cases in each group had. Exacerbations were considered as direct spread from old lesions or as entirely new lesions. It was found that 35 per cent of the patients in group "A" had exacerbations as compared with 32.5 per cent of those in group "B".

Comparing the conditions of the patients in these groups from the standpoint of extent of lesion and subsequent clinical course, we find, after a year and a half of observation, nothing to indicate that the increase in activities allowed these patients was particularly detrimental to them.

Group "C" consisted of 5 employees who had tuberculosis and who worked full time. Four of these people did very well. The fifth case had a series of resolutions alternated with exacerbations. She subsequently was advised to reduce her activities which she did for two months after which she was as active as ever. One is never safe in making any very definite statements from an experience with five cases. Nevertheless these cases add further confirmatory evidence to the belief already held which is that tuberculosis may sometimes be treated, by men with experience in the treatment of tuberculosis, in an ambulatory manner.

Group "D" is interesting even though there were only seven in the group. The patients in this group showed clearing in one part of the lung and slight extension of a lesion in another part. In the judgment of their physicians, the condition of these patients indicated the suitability of granting them an increase in activities, mainly as a palliative measure, in less than three months after the x-ray which showed the findings. Five of the seven were classed as improved or better. The remaining two in this group were classed as unimproved.

In considering groups "C" and "D", we find nothing to support the idea that a patient's exercise should not be increased when the lesion is showing evidence of healing on the x-ray, provided, of course, that there are no other contra-indications.

Group "E" consisted of sixteen cases who had no activities because their condition in the judgment of their physician would not warrant it. Eleven of these were far advanced and four moderately advanced. This group at the time the study ended showed 50 per cent either dead or unimproved. The cases in this group for the most part, had a relatively poor prognosis at the time they were admitted to the sanatorium, and we do not feel that the poor end results in this group even remotely suggest that bed treatment was in any way contra-indicated.

Discussion

There is no definite evidence we can find that a slowly healing lesion is any more likely to become activated than one which is perfectly stable.

The x-ray simply records in a gross way the condition of the pulmonary lesion at the time the film is taken. It is more than likely that the lesion is changing all the time, (either by extension or by healing) but that these changes are so slight that more frequent x-ray films would not record them. The x-ray still remains our most precise means of diagnosis.

The material presented here is not to be construed as advocating the discontinuance of the general principles of treatment of pulmonary tuberculosis, namely, REST. We feel that rest and the underlying principles of rest are of the utmost importance and that especially is this true at the beginning of treatment. It is after a long period of observation of each patient that the question of change in activities is to be considered. We believe that the beginning of activities should be determined, not by one single diagnostic factor such as the x-ray film, but by several factors. In fact, we believe that clinical judgment and individualization of patients should be the determining factors in the treatment of cases of pulmonary tuberculosis.

Summary

In the comparison of the two major groups, one treated by waiting for the lesion to appear stable on x-ray film, and the other having its exercise increased less than three months after x-ray improvement we find that:

(1) Those discharged as apparently arrested, arrested or quiescent were 40.5 per cent in group "A" and 32.6 per cent in group "B".

(2) Those improved or improving comprised 47.6 per cent of "A" group and 41.9 per cent of the "B" group.

(3) Unimproved numbered 7.1 per cent of the "A" group and 14 per cent of the "B" group.

(4) Mortality in group "A" was 4.8 per cent. Group "B" was 11.6 per cent.

(5) The number of subsequent relapses were 35.6 per cent in the "A" group and 32.5 per cent in the "B" group.

Therefore, in this study no appreciable evidence is found that patients whose exercise is increased in less than three months after x-ray improvement compare unfavorably with those whose exercise was not increased at the time of x-ray improvement.

Health Service in Educational Institutions*

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THE time has gone by when one is warranted in presenting before a group of this type a discussion of the need in an educational institution of a "health service" whatever its title or set-up. The need was recognized and its remedy suggested by the wise president of a New England college back in the '50's of last century. He saw that too many of his students were forced by ill health to drop out of college or suffered from physical handicaps after they were graduated. The remedy he suggested was simple and direct; medical examinations and supervision, early treatment of illness, regular physical exercise and instruction in personal hygiene. He finally induced the trustees to authorize and support a department of hygiene and physical education. This department has had a continuous and useful existence for upwards of 75 years. The problem which the Amherst president sought to solve appeared to him to rise in the main from the fact that boys who had been accustomed to a vigorous outdoor life on the farm or elsewhere suffered a physical deterioration and a lowered resistance due to the difference in living conditions which they experienced in college.

College life has changed in many respects since that remote day before the Civil War, but it is not too much to say that it still involves physical and mental hazards that are at least as dangerous to the individual as those of earlier days. At all events, the need is great, and adequate provision for scientific treatment of many phases of the physical and emotional problems of the boy or girl in school or college is indispensable.

It is a strange fact in view of the Amherst example of a comprehensive and well coordinated program of physical welfare that so few college and school authorities realized the significance and value of such a service of prevention and treatment and made similar provision for their own students. The few that did give any attention to this matter and were moved to provide some protection to the health of their students were apt to be satisfied with more or less adequate facilities for gymnasium exercises. Even when there was a gymnasium, trained leadership was generally lacking, medical supervision and a clinical service were rare. Meanwhile, a small group of the more active and vigorous students in each institution developed a sports program which was directed solely by the alumni.

It is true that there are a few institutions that for many years have supported a complete program. In the main, however, this matter of the welfare of the students was given little real attention except, perhaps, by a paragraph of generalities in the catalogue.

During the past 15 years the educational and promotional work headed up by the American Student Health Association has been effective in calling the attention of college and school authorities to both the value and lack of this type of service. But even now the program in too many institutions is inadequate and fails to meet student needs effectively. As a result our emphasis should now be directed to the development of a proper appreciation of the possibilities and value of this work and the desirability of establishing balance and coordination in its various phases.

A thoughtful student of social and professional organizations said recently that one of the most unfortunate trends today is the splitting up of education and medicine into a large number of specialties into which men enter without the broad training which would enable them to evaluate all phases of the subject or the person with which they are dealing. I think that the experience of many of us will tend to support this general observation, and that we have seen evidence of something of the same sort occurring in our own field. This tendency so far as it has reality, is, I think, dangerous and represents a handicap to the attainment of the real objective of our work, namely, the promotion and protection of the working efficiency of the student, that is the health of the "whole" student. It is only fair to say that the establishment and growth of the various services and activities that contribute to the mental and physical efficiency of the student have taken place in such a haphazard and uncoordinated way as to favor their continuance as separate entities and to retard the development of "team work" in the interest of the student.

Consider for a moment the list of these activities and services in the order of their development in most institutions excepting Amherst: Gymnasium work; competitive sports; medical examinations; clinical service, first ambulatory or office treatment, later hospitalization; instruction in hygiene and sanitation of environment; psychiatric services. In most institutions these functions were under separate direction, each independent of the others. Some of these, under different controls and auspices, as in the case of intercollegiate athletics, were practically independent of the institution. Others were partly within and partly outside, so that in the majority of institutions the student's experience in one office or field was a dark secret to the man in charge of another service to which the student might apply for help. In a few instances these various functions have been brought into a single administrative unit; too frequently they are uncoordinated or loosely related and even today when new fields of service are developed, they, too, are likely to be set up as independent units.

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†Chairman, Department Health and Physical Education.

Now our interest is not or should not be primarily in *organizations* such as clinical service, physical education, athletics or other related functions; we should be primarily concerned in the extent to which the services and activities can be developed and coordinated so as to make the best contribution to the welfare and development of the student.

Neither is the name or title applied to the administrative unit which includes this congeries of functions and services at all important so long as (1) provision is made for the various services required, (2) there is a well-trained staff in each field, and finally (3) that there is such a coordination of function and cooperation of effort as will bring the resources of the organization to a *focus on the problem* of the *individual student.*

The average college today has a student population so large that even so rare and wise a person as Dr. Hitchcock would find it impossible to acquire the intimate knowledge of the individual student which enabled him to render such an invaluable service to the small group in Amherst. This increase in the size of a student group raises new problems in administration, but does not change the principle. The needs of a student are the same whether he is one of 300 or one of 3,000. So our problem is to coordinate the work and records of a number of men in various fields so that any of them may have full information regarding essential points in the history of the individual student as a background for his guidance in making a decision in his own field.

As a result of continuous study of the methods of dealing effectively with the problem of the welfare of students, a program of work and relationships has been developed at Princeton along the following lines:

A. Thorough medical and physical examinations:

1. All new students.

2. All candidates for teams at the beginning of each season.

3. Medical supervision and guidance of students suffering from physical handicaps utilizing special examinations, reference to specialists, modified schedule both academic and physical, special diets, or other procedure that may be indicated in a given case.

4. Supervision of academic and activity program of students during period of convalescence following illness or operation. (It is to be noted that these examinations are very different from the detailed anthropometric observation and charts that were made of so many tens of thousands of students not so many years ago. These were used in a few institutions as a basis of statistics, but in most cases they were filed away since they were of little or no value as a basis for dealing with the individual student. On the contrary, these modern examinations lay the emphasis upon the functional condition of the individual, and are used constantly as a guide in directing his activities and furnish useful information when he is sick.)

B. Medical check-up and supervision of candidates for competitive athletics *throughout* each season—the important function of the "team doctor."

C. Provision for graded physical activities for exercise and improvement of body control, including special individual work, mass physical training, competitive sports, both inter- and intracollegiate contests.

D. Administration of curricular and physical activity program of students classified "C Medical."

E. The development through class instruction or conferences of the knowledge and practice of those habits of living that contribute to emotional stability and the promotion of mental and physical efficiency. *Attitudes* and *habits* are much more important and effective than mere *information.*

F. Psychiatric attention to maladjusted and emotionally unstable students.

G. Supervision of the clinical service and medical administration of the infirmary.

H. The organization of a single record that contains all facts relating to the physical condition and medical history of the student as shown by his original medical examination and follow-ups; his record of illness either in the infirmary or at home, or injuries in athletics; correspondence with family physicians or specialists; records of low scholastic standing and discipline in cases of boys with physical or mental handicaps; the development and causes of maladjustments. This entire record is available whenever the case of a student comes up for special consideration in the infirmary or in the department office.

This program is based on the following platform:

That the physical welfare of the individual student is best served by a plan of organization that will provide the closest co-operation possible in the various phases of the University program to promote his physical and mental efficiency.

That the infirmary, the gymnasium and the athletic field have long since lost their identity as institutions or organizations entirely independent of each other insofar as they affect student welfare, but they are really separate agencies working along allied lines with different methods directed to the same general end.

That the general medical supervision of the student's program and activities when he is on his feet, including the recognition and correction of maladjustments; clinical treatment when he is sick or injured; his program during convalescence after illness or operation, and his physical activity of whatever grade should be under the immediate direction of a single medical and technical personnel to deal with the various conditions and needs which may exist.

That a comprehensive medical and activity record for each student is a necessary element in the effective conduct of such a varied program.

We have much to learn, and a long way to go, before we are justified in feeling satisfied that we have this problem solved, and that we are supplying the service and guidance needed by our students. Conditions vary in different institutions, so that the first question to be considered in the organization or re-organization of this important department should be based upon the decision as to the kind and amount of service in the various fields which is deemed desirable and possible, and, the most effective and economical method of making these co-ordinated services available to the individual student.

We must not regard buildings, fields and facilities of any sort as the criterion of useful work. These are only the beginnings, the tools. Not infrequently a first-rate service is being rendered by an able man, in spite of the handicap of poor or inadequate facilities. This type of service to students in educational institutions cannot be handled successfully by impersonal and big-business methods, but requires personal contact between the student and the doctor or instructor who has information available regarding the medical and developmental history and the characteristics and problems of the student in all phases of his life. It is a service that calls for the utmost of training and understanding that the responsible officer can bring to bear on the problem of the individual.

Finally, the only criterion of success is the extent to which the work in these various fields contributes to the promotion of the mental and physical welfare of the individual student.

BOOK NOTICE

A UNIQUE BIOMETRICAL WORK

The Growth of the Surface Area of the Human Body, by EDITH BOYD, M.D., with a foreword by RICHARD P. SCAMMON, Ph.D.; first edition, dark blue cloth, 133 pages plus bibliography and index, illustrated; Minneapolis: The University of Minnesota Press: 1935. Price, $5.00.

This is a treatise which it is very cumbersome to appraise with accuracy. A vast amount of study and research have gone into its compilation, for, as Professor Boyd points out in her introduction, extant basic material is still "fragmentary because no simple, readily acceptable method exists for measuring an area of so irregular and curved a surface as is that of the human being."

Considering the methods available for measuring the surface area of the human body, the work discusses methods of estimating surface area, *formulae* for the relation of surface area to the major dimensions of the body, and concludes with the author's conclusions on the actual growth in surface area, both prenatally and postnatally.

This is too recondite a volume for the average obstetrician, pediatrician, or general practitioner; but the physiologist and anatomist will find it both interesting and valuable. It is a thorough consideration of an esoteric field of present-day physiology.

In passing, one might hope that the volume had been accorded the artistic attention tendered the productions of such well-known commercial presses as Paul B. Hoeber, H. K. Lewis & Company, of London, or Charles C. Thomas. The sterling work of such designers as DANIEL UPDIKE, ELMER ADLER, BRUCE ROGERS, W. A. DWIGGINS, and DOUGLAS MCMURTRIE could be emulated with happy results by the University of Minnesota Press.

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W. L. Klein, 1851-1931

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POVERTY AND PATIENCE

Letters from individual physicians have reached this office from time to time telling about their economic plights and asking for advice. Mostly they complain of inability to collect their fees from patients, but some relate the delay experienced with government agencies in remitting for services or responding to letters of inquiry, and the disparity of fee schedules in different sections.

Far from being unsympathetic in this matter we accept these interrogations as a complimentary indication of the confidence they have in our repeatedly expressed interest in the welfare of the profession.

The economic patient has been given so many hypodermic injections during the past few years that it is well on its way to narcotic addiction. A transfusion might be in order but for the lack of favorably disposed donors. Infusions already have been resorted to and now there is an animated discussion of the probable amount of further dilution the patient can stand. Rumblings of inflation have been heard, and even flatus serves a useful purpose at times to elevate the defatted and depressed organs in abdominal ptosis.

We don't know how nor exactly when, but Uncle Sam is certainly going to recover. Fat and lean years can never be accurately predicted; sometimes they run in series of seven, and we begin to sense a change in the seventh year now. Doctors as a class have been sorely tried and they have acquitted themselves with commendable gallantry. Patience, just a little more patience, and all will be well. A. E. H.

MEDICAL SOLIDARITY

To any doctor with prophetic vision, the prospect of socialized medicine imminently looms over the horizons. What form this socialization will take is problematical. Unquestionably, the temper of the public will be a determining factor and laymen in their official capacities on welfare boards will influence its development.

In the experiences of the depression, when authorization for and supervision of medical treatment have been delegated to inexperienced laymen, we have already an inkling of the course of events. That medical men and institutions have been and are now being imposed upon, in the expectation that they should carry an unwarranted part of the burden of social medical work, is apparent to the most casual observer. In some communities only fair remuneration has been given the doctors and hospitals—in others, the compensation has been so inadequate that it is ridiculous.

The responsibility for this state of affairs, while perhaps not wholly, lies with the profession itself. Because of a lack of co-operation, prompted by the most puerile impulses, professional jealousies and personal selfishness, the social agencies have been able to impose on the profession these injustices. There is hardly a community which has not its examples of chiseling and double-crossing on the part of the doctors. How pathetic and comic such a state of affairs is, can be illustrated by the incident which took place at a meeting of the physicians of a large city and county in North Dakota. A county commissioner who was present, upon perceiving, during a discussion of fees, the lack of harmony and agreement among the doctors, called them "fools."

It is to be expected and hoped that when social changes affecting the practice of medicine come, its administration will not be in lay hands and politics will not direct them, because such a course will jeopardize professional and public interest alike. That the directing force in the change will come from the medical profession we ardently hope, but the prospect that we as a body will be able to accomplish this is not assuring. Certain it is that the medical profession in its present moods, torn by internal dissension, stimulated by selfish competitive interests, will be inadequate to the task. The profession needs an awakening and a purging. Without solidarity we fall, and once in the morass of a socialized medicine which dictates to the profession the hows and whys of practice ,we shall never extricate ourselves, and the high standard which medical advancement has achieved in America will be gone forever.

J. O. A.

TUBERCULOSIS IN THE CATTLE HERDS

On December 1, 1935, thirty-three of our forty-eight states and the District of Columbia were accredited with reference to the control of tuberculosis among their cattle herds. This means that tuberculosis, as manifested by the tuberculin test, had been reduced to five-tenths of one per cent or less. The Uniform Methods and Rules effective in all of the states for the Area Plan of Control require that after a county is officially designated as a Modified Accredited Tuberculosis-Free Area, all the herds of cattle in which reactors are disclosed must pass three complete negative tests. The successive tests are applied to such infected herds until the percentage of infection in the accredited area is nil. In nine other states more than 50 per cent of the counties have been accredited. In Oklahoma this percentage already is 93.5 per cent. This leaves only a half dozen states in a rather bad plight, the worst of which are California with 12.1 per cent and South Dakota with 5.8 per cent of the counties accredited.

There has been a very definite organized effort to prevent cattle raisers of this country from submitting their herds to the tuberculin test, which was voiced loudly in Iowa a few years ago. In fact, it resulted in the testing "war" when violence was threatened by the opposition. It is stated that in one of the Iowa "war" areas, the license numbers of the automobiles which had transported many of the opponents to the scene were listed and the majority of them were from adjacent states. Thus, it appears that many of the "fighters" had been imported not only to agitate the cattle owners but also to actually take part in the disorder. However, today Iowa is one of the accredited states.

Apparently the cattle owners of South Dakota have been victimized to the point where they are now suffering more severely from false propaganda than those of any other state. This propaganda has been carried to at least some of the schools as is indicated by a letter from a South Dakota superintendent of schools in which the remarks of condemnation make it clear that this man has accepted it at its face value. That an educator could accept such teachings, when in his midst are veterinarians, nurses, and physicians, trained in the fundamentals of disease prevention and equipped with all of the information, is reprehensible. Certainly, an educator, whose livelihood depends upon the taxpayers and who is entrusted with the supervision of the education of the children of a county, should be more stable than to be swept away by "high pressure" salesmen of false propaganda.

The cattle owners of South Dakota now find themselves in a very serious plight. Many of the cities of the country, including Chicago and Kansas City, have passed ordinances which prevent the acceptance of dairy products from unaccredited areas. Thus, important markets were closed to the dairy men of over 94 per cent of the counties of South Dakota.

In the past, large numbers of South Dakota feeding cattle have been shipped to Minnesota but the latter state is accredited, as are all the states bordering on South Dakota and, therefore, does not desire to have this contagious disease imported from another state. The Live Stock Sanitary Board of Minnesota has recently provided that no animals, including steers, can be imported into the state unless they originate from accredited areas or unless they pass a satisfactory tuberculin test. A similar provision has been made in Iowa to become effective February 1, 1936. Thus, the cattle raisers of South Dakota have another closed market. It is gratifying to know that many are now eager to conform with what has been found to be the best procedure in so many other parts of the nation. In recent months, practically all of the range cattle in the state of South Dakota, west of the Missouri River, have been tested and good progress is being made in testing the cattle east of that river. However, since January 1, 1936, restraining orders have been issued by the opposition in six South Dakota counties. This will definitely handicap the work and eventually may have a serious effect on the cattle owners.

Those trained in animal and human medicine have long known that the cattle type of tubercle bacillus frequently causes disease which results in much deformity and even death when transmitted to human beings. Moreover, they know that tuberculosis among cattle has caused great economic losses to this country. The informed veterinarians of South Dakota, California, and other states which have not yet been accredited, are no less cognizant of the dangers of tuberculosis to animal herds and human beings than those in states which have been accredited. They have worked for the control of this disease among cattle and while they have been handicapped by organized opposition, lack of funds, etc., they must succeed because their program has been built upon fundamental principles.

The veterinarian is rapidly solving one problem for the physician by preventing the cattle type of tubercle bacillus from entering the bodies of human beings. This has had a decided influence on decreasing the incidence of positive human tuberculin reactors in America and should lead eventually to the extermination of tuberculosis caused by the cattle type of tubercle bacillus in the human family. In fact, it has already practically vanished from some areas of the nation. In the control of tuberculosis among human beings, we are about where the veterinarian was in the control of tuberculosis among cattle a quarter of a century ago. Protagonists of tuberculosis control in the human family are being opposed by arguments almost identical to those which the veterinarian met at that time. But the veterinarian has successfully demonstrated his method of tuberculosis control, and this method can be used with certain variations in the human family with the same degree of success as in the cattle family.

J. A. M.

HENRY GUSTAV WOUTAT, M.D.

Dr. H. G. Woutat passed away at his home in Grand Forks, N. Dak., November 25, 1935, aged 62 years. He was born in Winona, Minnesota, graduated from Winona Normal College and later from the University of Minnesota where he received his M. D. Degree in 1897. He interned at the Minneapolis General Hospital and came to Grand Forks in 1899 and formed a partnership with the late Dr. S. W. Rutledge. Dr. Woutat was one of the founders in 1915 of the Healy, Law and Woutat Clinic, and organization that gathered around it a body of progressive clinicians, that still serves the community, and of which his son Dr. Philip H. Woutat is a member. He was a pioneer in x-ray and radium therapy and in these lines developed a technic and skill that won him recognition as an authority. As a reader of radiographs he had the faculty of seeing in a plate what ordinary observers would miss and of interpreting them in such clear and definite terms that the pathology would be evident.

He was elected in 1919 as the first chief of staff of the Deaconess Hospital, Grand Forks, N. Dak., and again held that position at the time of his death. He was also a member of the Advisory Board of St. Michael's Hospital of the same city. In addition to holding memberships in local, state and national medical associations he was a Fellow of the American College of Surgeons since 1920, and a member of the American Radiological Society.

He was Health Officer of the city of Grand Forks from 1906 to 1908 during which time he gave the city its first laboratory diagnostis service, and was instrumental in having enacted its first Milk Inspection Ordinance and of having built the City Detention Hospital.

He loved nature in its quieter moods. His vacations were in the woods where the tall pines facinated him. It was an inspiration and a joy for him to watch a stately tree pierce the blue and kiss the sun and a source of never failing delight to linger by the shores of a limpid lake that mirrored the forest growth skirting its shores. As may be anticipated his hobby was flowers, specializing in peonies and roses. With infinite care he would nurture them, and they seemed to appreciate his kindly interest for they responded to his touch with blooms that were the admiration of all. He was a Director of the North Dakota Peony Society and his services as a judge at exhibitions were always in demand.

Among his professional associates Dr. Woutat was an acknowledged authority in his special fields and was honored by them as such. Among the people he served he was loved for his quaint humor and as the courteous gentleman, the sympathetic friend, the wise counselor, and skilled physician. He never played to the galleries but did his work calmly, earnestly, worthily, well; and many a seed by him quietly planted will germinate, grow, bossom and bear fruit in the years to come. Of him it might be said:

"In love he practiced and in patience taught
The sacred art that battles with disease;
Nor stained by one disloyal act or thought,
The holy symbol of Hippocrates."

James Grassick.

HONOR THE PHYSICIAN

Dr. Justus Ohage died at his home in St. Paul, Minnesota, on the day after Christmas, 1935, at the full age of 87. Military honors were accorded his burial; for Justus Ohage, in the early years of his long and fruitful life, had carried the distinction of being the youngest soldier in the Army of the Potomac.

When I knew him first as "our doctor," he was already a man ripe with honors and achievements. The importance of those achievements has become increasingly clear to me as I have grown up to learn more of the problems of medicine.

Justus Ohage was outstanding as a surgeon and a public health administrator, but above all he was a physician. Member of a German family (Hamburg) in which the practice of medicine was traditional, he had hung in needle-point on his office wall the German text beginning: "*Ehre den Arzt. . . .*" I can remember him taking me by the arm and pointing to that wall-motto with the admonition, "Do not forget it." The doctor was proud of the *responsibilities* of his profession.

Alas, like most things we should remember, I have forgotten the rest of the German text, but there is burned deep within me the English of the phrase which Dr. Ohage's life, as much as any man's, served to justify: *Honor the physician. . . .*

One of the latest honors that came to Justus Ohage was a tribute paid to him by 2,000 delegates at the 1930 session of the Interstate Post-graduate Medical Association of North America for his pioneer work in surgery. Most local honors had already fallen to his lot.

He was president of the Ramsey County Medical association in 1889 and was president of the Minnesota State Medical society in 1895. He was a charter member of the Minnesota Academy of Medicine. In 1890 Dr. Ohage was appointed clinical professor of surgery at the University of Minnesota and acted in that capacity for nine years.

In 1899, Dr. Ohage stood out as one of the most brilliant surgeons in the Northwest. Having pursued considerable post-graduate work in Europe, he had in 1886 essayed the first cholecystectomy performed in America. The operation was performed under considerable handicap, at St. Joseph's Hospital, St. Paul; for the principles of aseptic surgery were not yet thoroughly established. Opening the abdomen was still regarded with horror by many members of the profession, and Dr. Ohage was threatened with an indictment for manslaughter should the operation prove fatal. The patient recovered.

Then, in 1899, Dr. Ohage made another one of the courageous decisions that marked his life. He turned from surgery, in which his continuing success was assured, to public health administration, then a little-known and not too much respected field of activity. But he attacked this new work with strength and zeal.

He enforced pure food laws. Birth and death certificates were filed according to an orderly system. Compulsory vaccination was adopted in the schools. City garbage was properly collected and efficiently disposed of. Quarantine laws were strictly enforced. All milk sold in the city was subject to inspection and many herds of tubercular cows ordered killed.

In 1904, at the St. Louis World's Fair, St. Paul was declared to be the world's healthiest city and Dr. Ohage was awarded a medal for having made it so. In 1901 he capped a long career of civic-mindedness and private philanthropy by giving Harriet Island to the City of St. Paul, for the establishment of a recreation spot and public baths. It is hoped that the present "reclamation" of the Mississippi river will restore this island to the purpose for which it was so generously given.

The brief rehearsal of a brave, strong, and wise man's objective achievements cannot give the full picture of the man's life. Vast areas of his existence must pass under, except in the hearts of those who held him close and dear. But to all who knew Dr. Justus Ohage, whether as physician, friend, or father, his attainments and character must forever illumine the truth of the text: Honor the physician.

JUSTUS SCHIFFERES.

SOCIETIES

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting held November 14, 1935. Dr. Floyd Grave, President, in the Chair.

ACUTE GANGRENOUS APPENDICITIS WITH ABSCESS FORMATION COMPLICATED BY:

1. Incomplete Rotation of Cecum
2. Post Operative Mechanical Ileus
3. Oidium Albicans (Thrush) Infection of Mouth
4. Bronchopneumonia
5. Pleurisy with Effusion
6. Subdiaphragmatic Abscess Due to Vincent's Infection

Appendectomy and Drainage of Abdomen with Gibson Rubber Dam Tampons

Thoracotomy and Drainage of Subdiaphragmatic Abscess

Drs. R. C. Webb and H. M. N. Wynne

Dr. R. C. Webb and H. M. N. Wynne presented a case report of a white male age forty-one who was first admitted to the hospital on April 13, 1935. He was complaining of abdominal pain of twenty-four hour's duration. The pain came on after breakfast as a soreness in the epigastrium and under the lower ribs on the right side posteriorly. The pain did not radiate downward or upward. He vomited in the evening about twelve hours after onset. Sal Hepatica had been taken during the day. The pain had been so severe that he was unable to sleep.

On examination the general physical examination was normal throughout. He weighed 194 pounds and was five feet, six inches tall. The abdomen was very large, was soft throughout, and there were no tender areas. Posteriorly there was some tenderness to be made out in the region of the right kidney.

The temperature, pulse and respirations were normal on admission. In the evening of the day of admission his temperature rose to 100 degrees, and on the next day the temperature rose to 100.4 degrees. The temperature steadily decreased and was normal on the fifth day after admission. The blood count on the day of admission was 20,000 and 77 per cent P. M. Ns. Two days later the white blood count was 22,500, and the P. M. Ns. were 88 per cent. On the fifth day the white blood count was 11,000, and the patient was practically free from symptoms. X-rays were made of the urinary tract, and there was no evidence of urinary stone or of a perinephritic abscess. The tentative diagnosis was retrococcal acute appendicitis. Inasmuch as the patient apparently recovered, he was allowed to leave the hospital on April 20, 1935.

He was advised to remain under observation, and he was seen at the office on April 24, 1935 when the white blood count was still 11,000.

On April 27, 1935 he returned to the office and complained of a recurrence of the pain in the right upper quadrant posteriorly. The temperature was 99 degrees, pulse rate was 92 and the white blood count was 11,000. The findings were otherwise the same as on the previous examinations. He was sent to the hospital with the diagnosis of acute appendicitis and was operated upon immediately as follows: A four-inch right rectus incision was made and this incision was then extended upward because the appendix was found to lie against the posterior margin of the liver and on the upper half of the right kidney. There had been an incomplete rotation of the colon, and the cecum lay against the posterior wall in the right upper quadrant in the angle formed by the posterior margin of the liver and the right kidney. The appendix was found to be densely adherent and gangrenous, and there was a small abscess about the appendix. The appendix was removed, and a Gibson rubber dam tampon was placed to the appendix site. The wound was closed loosely about the drain. The laboratory report confirmed the operative findings. The operation was performed under ether anesthesia.

The post-operative course was exceedingly stormy. The position of the cecum and of the ileocecal valve complicated by the adhesions and the drainage, caused a danger of intestinal obstruction. Nasal suction was started about six hours after operation. This was continued off and on during the first seventeen days. There was distention and vomiting, and the patient was apparently suffering from mechanical obstruction whenever the nasal suction was removed. It was necessary to re-instate the nasal suction.

The wound progressed favorably, and the packing in the rubber dam tampon was entirely removed and changed on the fourth day. The position of the abscess caused slower healing, and it was necessary to keep rubber dam and Penrose drains in the wound longer than is usual when the appendix and the inflammatory area is located in the right lower quadrant. The patient was given fluids by proctoclysis, hypodermoclysis and venoclysis and was given five per cent glucose intravenously in order to supply nourishment. At intervals when the nasal suction was discontinued he was given fluids by mouth, but this was not all retained.

On May 9, 1935 the patient developed signs of infection in his mouth. A smear was taken and sent to the laboratory for examination. There were whitish spots in his mouth and there were shallow ulcerated areas over the entire oral cavity. The laboratory examination by Dr. Floyd Grave revealed the oidium albicans fungus known as thrush. The patient's mouth was very uncomfortable and he was treated with one per cent solution of gentian violet painted over the entire mouth and throat once daily for eight days. The mouth infection recurred on May 25, seven days later, and the daily treatments were again started and kept up until June 6, when the mouth became clear and remained so.

The patient's temperature had almost reached normal on the 38 day following operation and then the temperature began to rise in the evening. The pulse rate became slightly increased, and there were physical signs of involvement of the right lung posteriorly. An X-ray of the chest was made on June 9, 1935, and a bronchopneumonia with a slight amount of fluid was reported by Dr. M. B. Hanson in the base of the right lung. On June 17, 1935, fifty-two days after operation, the lower right chest was aspirated, and the fluid was examined and cultured. No bacteria were found, and there was only an occasional pus cell. The chest was aspirated again on June 19, and about six hundred cc. of slightly blood-tinged fluid was removed. This was likewise reported negative for bacteria. On June 24, 1935 the patient was X-rayed, and a moderate amount of fluid and a hydropneumothorax was reported in the right chest.

On June 25th the aspiration was repeated, and no fluid could be obtained from the chest cavity. The needle was then inserted through the diaphragm and about seventy-five cc. of thick, greenish, foul-smelling pus was removed. The needle had been inserted through the pleural cavity and withdrawn through the pleural cavity. Furthermore, there had been an opportunity for the pus to follow the needle through the puncture wound in the diaphragm and thus infect the pleural cavity. This fluid was found by Dr. Grave to contain an occasional pneumococcus with the spirilla and fusiform bacilli of Vincent. The culture from the fluid was negative at the end of forty-eight hours.

A diagnosis of a subdiaphragmatic abscess caused by Vincent's infection was made, and the patient was immediately transferred to the operating room, and on the sixtieth day following the appendectomy operation he was operated upon for the subdiaphragmatic abscess and infection of the right pleural cavity. A portion of the eighth rib was removed in the posterior axillary line region. The pleural cavity and the diaphragm were opened through this wound. A large Penrose drain was placed in the subdiaphragmatic region, and a stiff rubber tube was also placed between the diaphragm and the Penrose drain to insure keeping the tract open. Two Carrel tubes were placed in the pleural cavity, and Dakin's solution irrigation of the pleural cavity was instituted. It was felt that the pleural cavity was infected at the time of operation and that it was useless to attempt a two-stage operation which would permit a closing off of the pleural cavity from the infected subdiaphragmatic area. Our best remedy for such a condition is irrigation with Dakin's solution. Dakin's solution was injected into the pleural cavity and allowed to escape through the same point of drainage as that of the subdiaphragmatic abscess.

Neosalvarsan, .3 gram was given intravenously on the day of operation and was repeated with .45 gram at the end of four days and again after a second period of four days when .6 gram was given. The subdiaphragmatic abscess promptly ceased draining, and the large tube was removed and the Penrose drain was removed at the end of two weeks. The Dakin's irrigation of the pleural cavity was continued until three weeks after the thoracotomy when the Dakin's tubes were removed, and the chest wound promptly closed. The patient's temperature reached normal for the first time and remained so on the eightieth day following operation, and he left the hospital on the eighty-sixth day post-operative, which was July 22, 1935. He continued under observation at the office and returned to active work on September 21, 1935.

He has a ventral hernia through the operative incision. The post-operative obstruction kept the wound edges separated much longer than is usual in cases of this type, but there was a minimum of sloughing of the fascia. The patient is wearing a corset to support the abdomen, and he plans to have the hernia repaired at some future date.

This patient presented numerous points of interest which have prompted us to report this case. Acute appendicitis has been described by one of our master surgeons as the easiest surgical condition to treat when it is easy and the hardest to treat when it is hard. This patient presented difficulties from the beginning of his trouble to the end. The abnormal location of the appendix caused us to miss the diagnosis and confuse the condition with a kidney or perinephritic infection. Had his symptoms not subsided we would not have permitted him to leave the hospital without a better diagnosis, but he apparently had recovered and was anxious to return to his home.

The incomplete rotation of the cecum caused technical difficulties in an obese person which can only be appreciated when compared to a difficult cholecystectomy with the exception that the appendix was located deeper and was harder to get at. The post-operative mechanical obstruction was expected when we observed at operation the adhesions in this region and the angulation of the ileum as it approached the cecum.

Thrush infection rarely occurs post-operatively. It is a rare complication of appendicitis. There were no other cases of thrush in the hospital at the time to our knowledge, and we did not discover the source of the infection. It developed on the thirteenth day after operation and after about thirteen days of nasal suction. It is well known that thrush may be transmitted by unclean utensils and that the prevention is simpler than the treatment. The one per cent gentian violet solution seemed to control the disease satisfactorily in this case. The pleurisy with effusion which developed on the forty-fourth day yielded to simple treatment combined with aspiration.

Subdiaphragmatic abscesses caused by Vincent's organism have not previously occurred in our experience. It is well known that this is a most unfavorable complication, and we felt that the prompt treatment with neosalvarsan combined with surgical drainage had a good deal to do with the satisfactory treatment of this complication. Subdiaphragmatic abscesses are always serious complications in appendicitis. We regret that the patient is not here tonight to exhibit himself and his scars, but he has a job and is working nights, and we did not feel justified in asking him to lose a day's pay although he was perfectly willing to do so. We merely ask you to accept our word that he has recovered. He is apparently entirely cured.

Discussion

Dr. Floyd Grave: This is a very interesting and much complicated case of appendicitis which Dr. Wynne reports. I saw this patient and did the laboratory tests. The throat was covered with a thick, white cheesy material which was easily scraped off. Smears showed many fungi demonstrated easily after the application of potassium hydroxide to the material on the slide. It was the thrush fungus.

Pulmonary Vincents infection is occasionally found. This complication was probably from this source. Negative cultures of this are not surprising since the organism does not grow on ordinary laboratory media. The fact that negative cultures were obtained and that neosalvarsan was successful in eradicating it is a therapeutic proof that this was without doubt the type of infection dealt with.

Dr. R. L. Wilder: In relation to the thrush reported in this patient, I would like to say just a few words. When mothers were accustomed to wash out baby's mouths, thrush occurred very commonly. Since mothers have been educated to leave the infant mouth alone, thrush occurs rarely. In the infant mouth, trauma from tubing is very apt to produce a portal of entry and thrush is a frequent invader. In this case, repeated tubings were done and I think it not unusual that thrush occurred, even though this patient was an adult.

Dr. O. J. Campbell: The case presented by Dr. Webb illustrates an interesting chain of complications following acute appendicitis.

In my experience subdiaphragmatic abscess following appendicitis is a rare complication. In most of the patients explored for this suspected complication, subdiaphragmatic abscess has not been found. I urge caution in using a high-lying non-functioning diaphragm as being pathognomonic of subdiaphragmatic abscess. Right sided intra-abdominal suppurative conditions are frequently associated with paralysis of the right diaphragm. In patients which have been explored for subphrenic abscess where the condition has not been found, the diaphragm has been completely atonic and flaccid.

Occasional explorations must be performed but I urge critical consideration of this single symptom unsupported by other evidence.

Dr. S. R. Maxeiner: In a recent article the attention of the clinician is called to the fact that he must always be on the alert for a subdiaphragmatic obscess. Given a patient with a ruptured appendix, perforated ulcer or any of the other suppurative intra-abdominal lesions, who is not getting along very well and who is running a septic temperature, a most careful check should be made for this condition.

I think it is often absolutely necessary to attack the subdiaphragmatic abscess transpleurally, either for diagnosis with the aspirating needle or by the transpleural operative route. However, I feel that the approach through the bed of the resected twelfth rib in which one remains constantly beneath the diaghragm is a safer procedure. However, we can not always reach the abscess by this route. I remember a case at the Veterans' Hospital in which we attacked the subphrenic abscess by resection of the twelfth rib but were unable to reach the pus. We were still positive that he had a subphrenic abscess and approached it by the anterior extraperitoneal route, pushing the peritoneum downward instead of penetrating it. In this instance we were able to drain the abscess without passing through the peritoneal cavity. Ofttimes there is nothing that taxes the surgeon's diagnostic acumen more than a subdiaphragmatic abscess.

Some time ago we performed transpleural drainage for a subdiaphragmatic abscess following a ruptured appendix with extensive peritonitis. The patient developed an empyema which was also drained. Autopsy revealed a passage along the side of the colon underneath the diaphragm and through the thoracic cavity. In this instance sepsis cost the patient his life in spite of extensive drainage, transfusions and every other means of supportive treatment. We have had about seven cases of sub-diaphragmatic abscess in the last four or five years, most of which have followed acute suppurative appendicitis.

I had a particularly interesting experience when I was doing X-ray work at a casualty clearing station in France where a patient was sent to me following the drainage of an empyema but in which no pus was encountered. I examined the patient with a portable X-ray and made a diagnosis of a subdiaphragmatic abscess and recommended that the diaphragm be penetrated. It was interesting to note that the man who received my recommendation was Colonel Carless, consultant for our army corp, the author of Rose and Carless *Surgery* which we studied at the University.

Dr. M. H. Nathanson: The diagnosis of subdiaphragmatic abscess is difficult; however, this condition should certainly be suspected after surgery in the abdomen which is followed by the development of fluid in the right pleural cavity. The presence of such fluid is strongly suggestive of an extension from a subdiaphragmatic infection.

Observation of the diaphragm under the fluoroscope may be of value. If the patient is too sick to stand in front of the fluoroscope it is possible to study the respiratory excursion of the diaphragms by taking an ordinary bedside film on inspiration and on expiration with two different exposures on the same film. Inspiratory and expiratory positions of the diaphragms can be seen and it is possible to determine any difference in motility.

THE DIAGNOSIS OF BEHAVIOR AND PERSONALITY DISORDERS IN CHILDREN FROM THE STANDPOINT OF THE PEDIATRIST

Dr. Max Seham

Being neither a psychologist nor a psychiatrist you might question my right to speak on this subject. But I want to assure you at the very outset that I do not propose to discuss the graver abnormalities of mental disease such as neuroses or psycho-neuroses. I shall limit myself to those milder behaviour and personality disorders, which in clinical medicine are commonly referred to as "functional" and which the pediatrist is confronted with every day in his practice.

In medical practice today our greatest needs are methods of diagnosis which are not only reliable but practical.

In the abstract the practitioner has at his disposal five accepted methods of diagnosis of behaviour and personality.

(1) Physical methods including blood and X-ray studies.

(2) Psycho-physiological tests.

(3) Personality studies as per psychiatric methods.

(4) Questionnaire and case history methods.

(5) Observational methods.

I. Physical Methods—Organic disease may produce behaviour changes: Hemorrhage at birth, encephalitis, meningitis, brain tumors, congenital syphilis, the epilepsies and trauma are the most common organic diseases which produce functional changes. Endocrine disorders may also be the basis of maladjustments in children. Hyperthyroidism, cretinism, hypo and hyper pituitarism are easily diagnosed. There are, however, variations in physique and body structure resulting from endocrine imbalance not so clearly defined which may also produce many personality changes.

The physical method of determining the presence and degree of behaviour and personality changes includes the routine examination as practiced in the office, the measurement of the weight and height according to the standard tables as well as the X-ray and laboratory studies whenever indicated. The A. C. H. index of Franzen has not yet reached the threshold of the doctor's office. No doubt it would be a valuable aid in physical diagnosis.

More recently, chemical studies of the blood have been advocated for the diagnosis of functional disorders. To give one example, Cameron, author of the "Nervous Child," proposes in his glycopenic theory that not only fatigue, but other forms of nervousness, such as migraine, asthma, recurrent vomiting are the result of a hypoglycemia. We have been unable to confirm Cameron's work. In a study of a group of children suffering from such disorders we found no constant nor significant chemical changes. The fasting sugar, sugar tolerance tests and calcium of the blood, the basal metabolic rates show no significant differences in this group from the normal miscellaneous group.

II. Psycho-Physiologic Tests—It would, of course, be of great practical importance if the degree or the amount of deviation from normal behaviour could be measured objectively by tests. A large number of psycho-physiologic tests have been devised and applied in practice. In an effort to determine the validity of these proposed tests for diagnosis of general efficiency, particularly fatigue, and nervousness, we used twenty-three tests on 135 children, half of whom were normal and the other half suffered from functional disorders, such as chronic fatigue, hyperkinesis and other similar conditions.

An analysis of the data obtained for the physical capacity of normal children by means of the stationary bicycle, shows that the physical capacity of normal children is so variable that it cannot be used as a basis of comparison with the physical capacity of abnormal children (Table I). The same individual will perform different amounts of footpounds at subsequent sittings. For instance, H. R. performed 40,000 footpounds at one time and 56,000 footpounds a week later. With so high a variability existing in normal children, the line of demarcation between the normal and the abnormal cannot be determined.

As far as the validity of the other tests studied the results are equally discouraging (Table II). A comparison of the average in the slow movement test shows a greater steadiness in the abnormal cases (0.36 of a circle against 0.81). In the letter cancellation test, the difference (81.7 as against 75.7) is too small to be considered sufficiently significant for diagnostic use. The tapping test is also apparently negative (82.1 as against 75.4). Nor do we find that the body balance test (118.6 and 146) and the stick balance test (14.8 and 6) can be used for practical purposes. Only, in the steadiness test does there seem to be an indication that abnormal children are less steady. Whether this test can be used for diagnostic purposes remains to be shown by further experimentation. The advocates of the psycho-physiologic tests assume that the amount and quality of performance indicate the physical and emotional fitness of an individual. They do not give sufficient consideration to other factors which affect performance, such as motivation and practice. It is one thing to determine the output of work of a single organ by measuring the efficiency of the quality or quantity of its particular function such as the volume of flow through the heart, or to measure the efficiency of a group of muscles by the frequency and extent of their contractions, but it is an entirely different matter to measure the efficiency of the entire nervous system or of the functional capacity

TABLE I
EFFECT OF MAXIMUM AMOUNT OF WORK IN FOOT-POUNDS ON PULSE AND SYSTOLIC BLOOD PRESSURE—AGE 12 YEARS

Subject	Age in Years	Weight in Pounds	Height in Inches	Foot-Pounds of Work	PULSE					SYSTOLIC BLOOD PRESSURE							Remarks
						After Exercise					After Exercise						
					Before Exercise	Maximum Reading	Time of Maximum Reading, Sec.	Rise	Reaction Time, Sec.	Before Exercise, Mm.	First Reading, Mm.	Time of First Reading, Sec.	Maximum Reading, Mm.	Time of Maximum Reading, Sec.	Rise, Mm.	Reaction Time, Sec	
J. D.	12	68	48½	^{1} 48,048	96	192	5	96	600+*	113	140	5	158	40	45	570	*Pulse 114 at 600″
				^{2} 40,275	84	168	5	84	600+*	113	148	5	158	20	45	510†	*Pulse 108 at 600″ †Presence of principal might have delayed drop of blood pressure
H. R.	12	75	56½	^{2} 56,881	90	216	5	126	600+*	103	138	5	144	50	41	420	*Pulse 120 at 600″
				^{1} 40,481	90	192	5	102	420+*	101	138	5	155	30	54	390	*Pulse 120 at 420″
A. M.	12	109	61½	^{3} 44,837	96	180	5	84	600+*	136	188	5	188	5	52	330	*Pulse 120 at 600″
				^{1} 37,740	72	180	5	108	450+*	129	135	5	155	30	27	210†	*Pulse 126 at 450″ †Blood Pressure below normal at 240″, 116 at 450″
				^{2} 26,240	90	156	10	66	900+*	132	169	20	169	20	37	150	*Pulse 120 at 900″, 90 at 30 minutes
D. G.	12	100	58¼	^{1} 44,514	115	180	5	65	420+*	115	126	5	138	30	23	210	*Pulse 132 at 420″
				^{2} 30,139	112	168	5	56	540+*	112	130	5	132	5	20	210	*Pulse 115 at 540″; murmur
J. T.	12	76	55½	^{1} 30,709	84	...	..	..	360+*	102	124	5	124	5	22	180	*Pulse 126 at 360″; Exp. 1 against 1½ pounds
				^{2} 12,622	104	...	..	..	420+*	100	121	10	130	30	30	360	*Pulse 120 at 420″; Exp. 2 against 1¼ pounds
F. B.	12	89	54¾	^{1} 24,299	84	156	10	72	480+*	102	107	15	127	50	25	240	*Pulse 96 at 480″
				^{2} 29,224	90	156	5	66	390+*	100	115	5	134	20	34	300	*Pulse 102 at 390″
J. B.	12	88.5	58	^{2} 28,711	66	...	..	..	600+*	98	129	5	136	20	43	360	*Pulse 82 at 600″
				^{1} 14,836	60	...	..	..	600+*	99	124	10	132	20	33	270	*Pulse 78 at 600″
M. S.	12	81.5	..	25,452	87	...	..	..	600+*	97	120	10	133	50	36	450	*Pulse 120 at 600″
A. J.	12	74	57¼	^{1} 22,970	84	156	5	72	600+*	115	152	5	152	5	37	270	*Pulse 90 at 600″; murmur
				^{2} 20,853	66	132	5	66	540+*	116	140	5	147	20	31	210	*Pulse 84 at 540″
R. B.	12	62.5	52¾	^{2} 18,407	84	156	10	72	540+*	109	155	5	159	10	50	390	*Pulse 108 at 540″
				^{1} 14,069	96	180	5	84	540+*	112	148	5	149	5	36	240	*Pulse 108 at 540″
A. G.	12	80.5	60	^{1} 16,904	84	168	30	84	240+*	107	134	30	140	60	33	240+†	*Pulse 108 at 240″ †Blood Pressure 114 at 240″ (one of first Exp. made)
.				^{2} 14,667	84	168	5	84	480+*	107	128	5	145	40	38	270	*Pulse 96 at 480″
M. R.	12	74	56	16,790	108	132	30	24	240	108	152	30	152	30	44	450	
12 cases, 23 determinations	12	84.1	56	29,216	87	171.8	5	81.6	600+	110	136.8	5	144.2	24.3	36.2	323	M. R. excluded

TABLE II

COMPARISON OF ANATOMICAL MEASUREMENTS AND OF OBJECTIVE TESTS OF NORMAL AND ABNORMAL SUBJECTS

	NORMAL			ABNORMAL		
Measurements and Tests	Average	Med. dev.	Per cent Med. dev.	Average	Med. dev.	Per cent Med. dev.
Height (inches)	57.5	1.83	3.18	59.17	2.37	4.01
Weight (pounds)	86.2	3.95	4.65	81.4	7.98	9.8
Circumference of head (cm.)	53.13	1.25	2.36	53.33	0.87	1.63
Circumference of chest (cm.)	67.4	3.57	5.29	61.7	4.58	7.42
Circumference of biceps (cm.)	22.1	1.04	4.7	20.1	1.39	6.91
Circumference of elbow (cm.)	23.1	1.41	6.104	22.3	1.38	6.19
Slow movement (a)	1.51	0.67	44.66	1.77	1.08	61.00
(b)	0.81	0.394	48.64	0.36	0.74	205.5
Letter cancellation (a)	40.9	4.03	9.85	37	5.57	15.06
(b)	81.7	11.31	13.84	75.7	13.04	17.22
Steadiness test—4 hole (a)	4.13	3	75	8.7	4.88	50.3
(b)	5.4	3.9	73.7	8.16	5.95	74.37
5 hole (a)	10	5.66	56	16.3	6.80	42.8
(b)	10.8	6.22	57.6	15.48	7.21	46.53
6 hole (a)	20.80	8.00	38.09	19.30	9.37	51.22
(b)	19.42	7.89	41.52	15.2	6.93	45.59
7 hole (a)	25	10.2	40.8	30.15	7.75	28.75
(b)	24.4	11.3	46.3	31.10	8.63	27.83
8 hole (a)	32.3	11.59	35.89	38.85	8.3	21.29
(b)	35	12.19	37.68	38.58	7.89	20.23
Body balance (seconds)	118.6	16.31	13.82	146	72.39	56.3
Stick balance (seconds)	14.8	15.9	10.6	6	3.51	58.5
Tapping (a)	69.5	11	15.83	67.13	12.39	18.49
(b)	82.1	7.86	9.59	75.4	9.57	12.69

of the body as a whole. Up to the present time the search for a single, simple, accurate test for the diagnosis of functional disorders has been a vain quest.

III. Psychiatric Technics—The methods of diagnosis employed by the child psychiatrist are beyond the scope of pediatric office practice. The pediatrist is really a general practitioner. His load of specialties has become so heavy that he cannot add another one so difficult in technic, so complicated in set-up and so consuming in time. His job in this respect is well done if he recognizes early the graver abnormalities, such as neuroses and psycho-neuroses and refers them to the psychiatrist.

IV. Case History, Questionnaire Method—History taking is the most natural and the oldest method employed in the diagnosis of disease. Nevertheless, one finds little attempt in medical literature to standardize and objectify this method. The technic as taught in medical schools and practiced by most physicians is localized to the detection of physical disease and colored by the attitude and the experience of the examiner. The absence of standardization and objectivity is attested to by the divergence of the data obtained by clinical clerks, internes and staff physicians on the same case. The form of history taking as taught and practiced today is definitely inadequate for the diagnosis of behaviour and personality disorders.

As to the questionnaire, I am fully aware that at the present time, both as a method of investigation in medicine and in individual diagnosis, it is in ill repute. It is looked down upon by the medical profession at large as another one of those "psychological methods" and is listened to at medical meetings with drooping eyelids. The two special questionnaires which I shall present were given to 268 children from eight to fifteen years of age to secure more comprehensive histories in a minimum space of time of the daily activities of the child and of his behaviour and personality. Each child answered both questionnaires on "Health Habits" and "Health Efficiency" twice within a week's time. Wherever any answers were doubtful the child was given a personal interview. Each child was given a complete physical examination. His weight and height were determined. Sixty-five children were also examined for the presence of tics and for their functional reactions according to the observational method to be described in a later slide. In addition the school health records were made use of, especially with reference to past illnesses and medical treatment. In about one-half of the cases complete questionnaires from the mother and from the school teacher were also obtained.

Our method of procedure was as follows: We instructed the children as they sat in their classrooms to answer the questions as honestly as they knew how. We assured them that they would not be marked and that no one would know anything about the answers except ourselves. If the respondent was unwilling or did not take the questionnaire seriously his questionnaire was omitted. The children were allowed to take all the time they needed and if they did not understand the questions they were to ask us for information. The "test" was given during the first hour of the morning session. The younger children took 45 minutes and the older children 30 minutes for their answers. *Questionnaire No. I, *Health Habits*, covers the details of the child's life over a period of 24 hours. It includes the following nine items: (1) Sleep, (2) Food, (3) Physical Activities, (4) Home Study, (5) School Social Activities, (6) Outside Social Activities (dances, theatres, orchestra work and the radio), (7) Miscellaneous Activities, (8) Home duties and outside work for pay, and (9) School Attendance. The presence of similarity is tabulated in Table III. It can be seen that the percentage increases with age, being lowest in the eight-year-old children. However, the increase with age is not uniform. The average of similarity for boys is 92 per cent and for girls 93 per cent.

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*Complete Questionnaire omitted because of lack of space. For reference see Jrl. Ed. Res. (Research Quarterly, Vol. 5, No. 2, May, 1934.)

TABLE III

MEANS, PROBABLE ERRORS, AND STANDARD DEVIATIONS FOR PERCENTAGES OF SIMILARITY FOR HEALTH HABITS

	BOYS				GIRLS				TOTAL
Age	N	M	PEm	SD	N	M	PEm	SD	
8					13	83.50	2.03	10.84	83.50
9	9	83.72	2.66	11.82	8	92.88	1.05	4.40	88.30
10	11	88.18	1.08	5.29					88.18
11	10	93.40	1.28	6.00					93.40
12	43	94.48	.62	6.04	37	96.08	.42	3.80	95.28
13	43	93.76	.61	5.95	30	94.30	.88	7.14	94.03
14	17	89.71	1.40	8.54	11	95.36	.67	3.31	92.53
All	142	91.99	.43	7.64	110	93.10	.47	7.28	

N equals Number
M equals Mean
PEm equals Probable Error of Mean
SD equals Standard Deviation

The questionnaire on efficiency is composed of 91 questions covering 12 health functions. These questions are directed toward those signs and symptoms of functional disorders which most commonly afflict children of school age. They appear in the questionnaire in the following order: (1) General Health, (2) Social Maladjustment, (3) School Efficiency, (4) Headaches, (5) Growing Pains, (6) Seat and Desk Maladjustment, (7) Defective Vision, (8) Defective Hearing, (9) Fatigue, (10) Idiosyncrasy to Food, (11) Nervousness, (12) Circulatory Symptoms.

The contents of this questionnaire are divided into three groups representing (1) the subjective feeling or attitude of the child. For example, "Do you always feel well and strong?" "Are your feelings ever hurt so badly that you cry?" The similarity in the answers to these questions was over 90 per cent.

(2) The knowledge of the child as regards his pains or discomforts, calling forth yes or no for an answer, i.e., "Do you ever have headaches?" "Do you ever have backaches?" Here one might suspect that young children might not discriminate accurately between different types of sensory disturbances. However, our calculations show that such questions are answered with a similarity of over 90 per cent. Even in the younger children the questions on headaches were answered with a similarity of 92 per cent.

(3) The third group of questions require more objective replies, such as numerical answers, for instance, "How often do you have headaches?" "How often do you have backaches?" Though the consistency of the answers in this group is lower than that of the preceding groups, the average percentage of similarity is about 85.

Table IV. The age does not seem to affect the consistency of the answers, the average similarity being almost 92.00 per cent. The results of the statistical analyses would, therefore, justify the trial of this questionnaire for validity.

Table V shows the validity of the questionnaires. The answers to the questionnaires of a hundred miscellaneous normal children were compared with those of a hundred children definitely abnormal. The latter suffered from underweight (weight-height index 10 per cent below average) were free from physical defects and chronic infections and had definite signs and symptoms of functional disease. It can be seen in the first column that the average number of inadequate health habits in the questionnaire for "Health Habits" is 5.05 for the normal as compared to 9.79 for the abnormal. In that of "efficiency" the ratio is 3.63 and 9.09. A similar contrast is found in the questionnaires answered both by the mother and by the school teacher.

V. Observational Method—For many years the movements of the external muscles, the attitudes and postures of the body and the signs of visceral activity have been used by physicians as diagnostic indices of the functional state of the body. At the present time, however, there is no agreement in procedure nor in interpretation of overt behavior. No specific procedure to observe and record functional signs of the body is taught in medical schools. The student becomes alert to the presence of a boil, while he overlooks common motor manifestations of behavior "tics." The interpretation also varies because of a lack of normal standards. For instance, physicians do not agree as to what constitutes abnormal motor restlessness.

The data to be presented in the next four slides includes all the information which I could possibly obtain by combination of the questionnaire and observational methods. The subjective symptoms were elicited from

TABLE IV

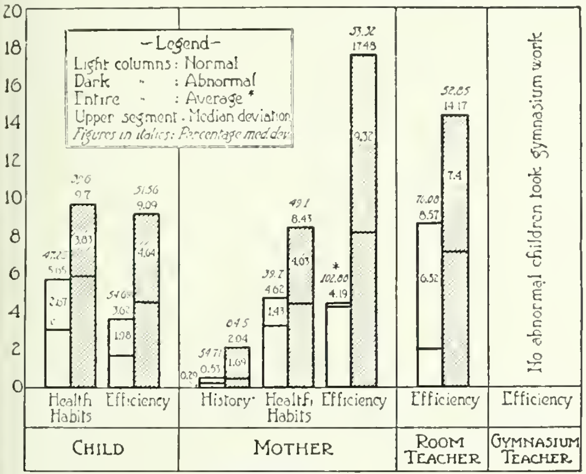
MEANS, PROBABLE ERRORS, AND STANDARD DEVIATIONS FOR PERCENTAGES OF SIMILARITY FOR HEALTH EFFICIENCY

	BOYS				GIRLS				TOTAL
Age	N	M	PEm	SD	N	M	PEm	SD	
8					13	88.88	1.59	8.50	88.88
9	9	87.06	1.16	5.14	8	91.25	1.82	7.64	89.03
10	11	88.82	1.58	7.76					88.82
11	10	94.90	1.52	7.13					94.90
12	43	93.73	.38	3.74	41	92.78	.51	4.81	93.27
13	42	92.12	.65	6.28	30	92.17	.77	6.26	92.14
14	17	89.82	.84	5.15	11	92.27	.72	3.54	90.73
All	141	91.61	.36	6.26	114	91.92	.39	6.24	

M equals Median
PEm equals Probable Error
SD equals Standard Deviation

TABLE V

Comparison of Questionnaires of Normal and Abnormal Subjects



*With the exception of the "Efficiency" of the Normal Mother.— Average: 4.19 Med. dev.: 4.31

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the child, the mother and the school, the gymnasium and visiting teachers. The objective signs were collected in different settings, in the classroom, in play activity, in the office, and in the gymnasium.

All the signs and symptoms which were obtained by these two methods may be roughly classified into seven groups:

(1) Changes in sensation.
(2) Changes in visceral and sense organ activity.
(3) Changes in posture.
(4) Changes in motor activity.
(5) Changes in speech.
(6) Changes in emotion.
(7) Changes in mentation.
(8) Changes in facial activity.

Table VI, *Changes in Sensation*—The changes in sensation involve the body as a whole, such as feeling of fatigue; tiredness; sleepiness; limpness; inertia, and recurrent exhaustion; or they are localized such as muscular pain; precordial pain; stomach aches, and headaches.

The *changes in mentation* refer to difficulty in learning; lack of concentration; poor associate power; indecisiveness and unreliability.

TABLE VI

Changes in Sensation
Feeling of fatigue.
Daily morning tiredness.
Sleepiness during day.
Numbness of hands and legs.
Limpness.
Inertia.
General weakness.
Loss of strength.
Recurrent exhaustion.
Muscular pain.
Precordial pain.
Stomach aches.
Headaches.
Being hot.

Change in Mentation
Difficulty in learning.
Lack of concentration.
Poor memory.
Poor associated power.
Short mental endurance.
Indecisive.
Unreliable.

Changes in Emotion
Habitual hyperirritability.
Excitable.
Fretful.
Impatient.
Ill-tempered.
Temper tantrums.
Unkind.
Hostile.
Obstinate.
Aggressively mean.
Maliciously mischievous.
Anxiety.
Unrest.
Uneasiness.
Worry about trivial matters.
Fearful.
Loss of courage.
Morose.
Indifferent.
Listless.
Apathetic.
Unhappy.
Excessive demand for attention.
Excessive demand for affection.

The *changes in emotions* habitual hyperirritable; fretful, excitable; temper tantrums; unkind; obstinate; anxiety; unrest; indifference; apathetic; unhappy.

Table VII, The *changes in motor activity*. Here we have two sub-divisions, hypoactivity with tendency to remain immobile and quiet; reaction time decreased; inabality to hold objects well; laziness; refuses to partake in games and exercises. And hyperactivity with overactiveness to ordinary stimuli; restlessness; reaction time increased; non-co-operative; muscular accidents; destructiveness, and tics.

Speech disturbances—Stutter; stammer; lisp or block. The rate, the rhythm and the pitch of voice may be involved.

Table VIII *Body Mechanics*—The diagnosis of normal or abnormal body mechanics was made only by inspection. The examiner decided whether the individual child, as he sat, stood or walked during the routine examination, had poor or good posture according to the items shown in the slide.

Facial activity—The facial activity, tired; agitated; dejected; drawn; tension of the mouth; yawning, and above all, the numerous tics, such as blinking, biting the lips, picking of the nose, nail biting, and so forth.

If behavior is used in the broader sense functional disorders of the viscera and vasomotor systems must be included. Table IX shows the change in visceral activity. Amongst the *circulatory signs* we find most frequently tachycardia and palpitation; unstable blood pressure, and

TABLE VII

CHANGES IN MOTOR ACTIVITY

Hypo-activity
Tendency to remain immobile and quiet.
Limpness and physical inertness.
Reaction time generally decreased.
Inability to hold objects well.
General incapacity for effort.
Laziness.
Refuses to partake in games or exercises.
Reflexes decreased.

Speech
Stutters; stammers; lisps; block.
Disordered speech; words tumble over one another.
Unable to get the right word.
Doesn't talk sense.
Excessive and continued running of words.
Very talkative.
Very loud.
Very slow.
Voice unsteady and strident.
Voice pitched too high, pitched too low.
Gasps for breath.
Interrupts.
Repeats.
Uses superlatives.
Much spontaneous utterances.
Rapid shifting of subject matter.

Hyper-activity.
Overactiveness to ordinary stimuli.
Reaction time generally increased.
Reflexes increased.
Restlessness.
Touches all objects.
Does not remain still on special request.
Non-cooperative.
Disorderly haste.
Jerkiness.
Muscular accidents, falls, cuts himself.
Drops things.
Takes unnecessary risks.
Destructive.
Tears and laughter come readily.
Tics.

TABLE VIII

	Facial Activity	*Posture*
Tired	Drawn	Poor posture in sitting and standing.
Pinched	Rapidly Shifting Expression	Slouchy, stooping; sagging.
Wrinkled	Mouth Breathing	Shoulders uneven.
Agitated	Tension of Mouth	Head held weakly, somewhat flexed.
Dejected	Yawning	Hands held unnaturally, wrist drop.
Sad	Flush	Feet unequally planted.
Dull	Pallor	If asked to hold hands with palms upward in front of body, the subject holds them unsteadily with slight or marked tremor, one arm lower than the other. There may be a fine or coarse tremor of the fingers.
Vacant	Chvostek	
Apathetic	Weiss	
Blank	Tics	Frequent changes in posture.
		Generally depressed relaxed body.
		Leaning against an object if possible.
		Shuffling, inelastic, stumbling gait.

abnormal response to postural changes and exercise. Changes in *skin and vasomotor system;* dermographia; pallor or blushing; excessive sweating; dryness of the skin; cold bluish hands.

The respiratory system — Breathlessness; *genito-urinary organs;* enuresis; *the gastro-intestinal system;* anorexia; constipation, and vomiting.

Changes in *sense organ activity* refer to the ear and eye. In the former we may find on the one hand signs of impaired hearing and on the other a heightened sensitiveness to noises. In the latter, puffiness, dark circles, soreness, burning of the eyes, vertigo; blurring of the vision and tics.

In conclusion I want to reiterate that in this paper I am not concerned with the graver abnormalities of mental disorders. These are strictly within the realm of child psychiatry. The pediatrist has neither the training nor the set-up for their diagnosis and treatment. For the majority of the disorders the pediatrist is called upon to treat, complete psychiatric studies are unnecessary. I do not want to leave the impression that psychological factors do not play an important etiological role.

I am fully in accord with the belief that human behavior, whether normal or abnormal, must have a psychic element as well as a somatic. It is probable that for every psychophysiological process there is an underlying or accompanying biochemical neural change although at the present time only conjectures can be made on that point. There is also no doubt that neural disposition, or heredity, conditions not only the normal growth and development of the nervous system but in a large measure determines subsequent reactions to the vicissitudes of life. It is equally certain that the activities of glands of internal secretion have a powerful influence on normal behavior and that disturbance of their functions is capable of producing abnormal reactions. The same may be said of the vegetative nervous system, though with less proof and considerably less certainty. But the practitioner of medicine, be he a general physician, pediatrician, neurologist or a psychiatrist, who is beset with the demands of the patient afflicted with these functional diseases, seeking relief and cure cannot wait until the final word is spoken on the nature or pathogenesis of these disorders. In such a dilemma a good test for etiologic diagnosis is therapy. The only working hypothesis which we possess today in office practice is the one which, when applied, gives the best results for the individual. In my own experience satisfactory results have been obtained by the use of the technic which is represented in the following case report.

Vera S., 12 years old, free from physical defects, was considered a nervous child since birth. While nursing she would hold her breath and get blue in the face. During infancy she suffered from repeated attacks of convulsions. She entered school at the age of five, and at twelve years of age she had advanced into the eighth grade. *Observational findings.* Her color was poor, dark circles around eyes; anxious, sad, relaxed facial expression. Posture very bad although fairly well nourished. Nails bitten down, skin of fingers chewed, marked motor restlessness, eyeballs restless, speech running fast and irregular in rate, and pitch. *Questionnaire findings.* Questionnaire Number II. She was very erratic and of a nervous disposition, which found ex-

TABLE IX
CHANGES IN VISCERAL ACTIVITY

Circulatory	*Skin and Vaso-Motor*	*Gastro-Intestinal*
Tachycardia	Dermographia	Anorexia
Palpitation	Pallor and Blushing	Constipation
Extrasystoles	Excessive Sweating	Diarrhoea
Dyspnea	Dryness of Skin	Nausea
Unstable Blood Pressure	Cold Bluish Hands	Vomiting
Abnormal response to postural change and exercise		Ptyalism
		Belching

Respiratory	*Genito-Urinary*
Low Vital Capacity	Enuresis
Breathlessness	Diuresis
Irregular, Jerky Breathing	

CHANGES IN SENSE ORGAN ACTIVITY

Ears	*Eyes*	
Hearing Less Acute	Puffiness	Looks Away When Speaking
Heightened Sensitiveness to Noises	Dark Circles	Squint
Tinnitus	Soreness	Restlessness of Eyeballs
Vertigo	Burning	Colors Around Letters
Remote Associated Disorders	Smarting	Vertigo
	Headaches	Photophobia
	Tics	Blurring of Vision
	Remote Associated Disorders	

pression in ready loss of temper, restlessness and fidgetiness. She did not sleep well and talked and walked in her sleep. Of late, it had become difficult to arouse her from her sleep, and if left to herself would sit down on the edge of her bed and gaze into space. She had given up her gymnasium because of headaches. On account of burning in her feet she disliked walking and had given up practically all physical activity. Previously she had been irritable and restless in school and of late she showed apathy and complete lack of interest. To the reprimands of the teacher she would answer with weeping, only again to sluoch back into her attitude of indifference.

Questionnaire Number I. *Food*—The morning was usually begun with a quarrel about breakfast with her parents (who themselves were suffering from excessive irritability). She then rushed to school without having eaten anything. For luncheon she usually selected at the school counter a dish of ice cream, cookies, and several pieces of candy. At supper, however, she ate a fairly substantial meal. In addition, she drank half a pint of milk during the morning recess.

Work and Play—Arriving home from school at 3:30 she practiced (until three months ago) for one hour on the piano. (Music lessons were dropped on account of pain in the arms and fingers.) The rest of the afternoon she was obliged to spend in further learning at a sectarian school. In the evening she studied her home lessons or went to the theatre, the movies, or in the company of her parents, visited with friends. Thus she rarely retired before 11 o'clock. Of healthy out-of-door play there was none.

Sleep—Though only twelve years of age her sleep had been limited to eight hours.

Treatment—(1) Reduction of overstimulation.

(2) A full breakfast, consisting of fruit, a dish of cereal with sugar and milk, two slices of buttered toast, a glass of milk or cocoa.

(3) A school day limited to the morning session only, until signs of exhaustion had disappeared.

(4) One hour rest after luncheon, the latter to consist of at least one hot vegetable.

(5) No home study nor music lessons.

(6) Two hours of out-of-door play every day.

(7) Light reading or listening to music after dinner (meat, green vegetables, potatoes, dessert), which was to be served regularly at 6:30.

(8) Bedtime at 8:00 o'clock.

(9) Rising time at 7:00 o'clock.

After two weeks of treatment she was allowed to attend school all day. Forty-five minutes were allotted to mental work outside of school, the remaining time to be spent in free activity out-of-doors. Bedtime was set for 8:30.

The pediatrist looks to the academic and clinical psychologists for reliable technics for diagnostic use. The psychologists, in turn, look to the pediatrists to test their validity and applicability. It is only by learning to speak each other's language and to agree upon the common goal to be attained that we can hope to build a more permanent foundation for the diagnosis and treatment of behavior and personality disorders in children.

Discussion

Dr. J. C. Michael: For the last decade and a half we have been hearing the terms "behavior" and "personality" much more frequently than prior to that time. Though the two terms are practically synonomous with "mind," the latter is invested with the traditional philosophic implication of a unity quite independent of the bodily systems. In psychiatry the word "personality" is used to convey a meaning that gets away from the more obsolete concept of dualism to which Dr. Seham referred.

Some workers in the mental sciences restrict their field of interest exclusively to objectivity of behavior defined as the motor and glandular responses in the human organism; emotivity and environmental play is rejected by them, because of the too theoretic and speculative foundations. Much of the literature that has cropped up in recent years and has been accepted too often quite uncritically indicates very obviously a too careless regard for the better tenets of science.

In our gropings for better methods and easier understanding, would it not be desirable that we attempt to simplify, if we can, our procedures; if, say, the student in medical school started off by having emphasized to him that first of all he is expected to apply simple common sense, the common sense that he has been able to develop in a wholesome family, in school and in his community life. Unfortunately, some education, too often some academic education, serves only to distort or curb good common sense. Yet, in the main, the student's acquisitions in the basic science years, in the fields of anatomy, physiology where he learns the functions of "parts" of the body, equip him to enable then an acquaintance with the proven facts, and such principles as are the least controversial, which concern the thinking, feeling, doing of well and sick persons he meets in his everyday routines. He is then studying mind, or the whole person, or the integrating functions of all the physical systems. The more complex propositions, the more difficult to comprehend categories, one might feel, are better left to later stages; too often when this is reversed, when the latter are sort of abruptly thrust before him, he can only become confused and befogged, and is it not then only natural that an attitude of hopelessness tends to develop and to remain all too indefinitely thereafter.

Dr. Seham spoke of the field of behavior disorders as it may pertain to the pediatrist *versus* the psychiatrist. My own inclination is that there is every good reason why the pediatrist and, it might be added, every practitioner, should interest himself with normal behavior and, at least, the commoner disorders of behavior which he is likely to encounter in his field. But after all, whether he deliberately wills it thus or no, is that not to some extent the practice even now? Admittedly it is better to establish the practice during the student years.

Dr. A. Beard: I wish to emphasize one point Dr. Seham passed over rather lightly, which I think is one of the biggest factors in this entire problem. As a medical student I was taught if a physician takes a good history nine times out of ten he has his diagnosis established before making a physical examination. I maintain this is still true.

I was interested in the number of approaches Dr. Seham mentioned. In adult work, particularly, there is a tendency to obtain histories in a perfunctory manner. We expect to find pathology, and when we don't we are apt to discard the information and think it is of no significance. A physician is a better doctor if he takes his own histories, allowing perhaps an hour of his time, rather than shifting this phase of the examination to a younger man in his group or his office who spends ten to fifteen minutes and feels he has procured all there is to the problem.

Dr. Edward T. Evans: Dr. Seham speaks of the first school of thought as being more or less mechanistic. May I congratulate Dr. Seham on having mechanized the second school of thought. It is, however, true that common sense must be used in the use of this outline which Dr. Seham has shown us. I trust that in his teaching and insistence on good histories, he does not turn out a student like one who came to us as an interne not long ago. Despite the fact that he saw the pus drained in an acute osteomyelitis case, he insisted that it could not have been an osteomyelitis because the clinical history and his physical findings were not in accord with notes which he had taken in school. Common sense must be used in interpretation of findings.

Dr. M. H. Nathanson: The fault is greater than merely a fault in teaching history taking. The method of history and physical examination as taught in school is quite adequate but is directed entirely at structural diseases. The student has a good course in the basic sciences, learns his pathology very well and sees a number of autopsies showing tumors, inflammations, calculi and a variety of other structural changes. He learns the symptomology and the physical findings of these structural diseases. He may learn, for example, that tuberculosis, hyperthyroidism or early diabetes may manifest itself with fatigue. Because of his teaching, when he gets out in practice he expects to find these conditions if a patient complains of fatigue, and if they are not found he is puzzled and it is not surprising that he concludes that the patient is using his imagination. The point is that the student learns nothing about functional diseases and this explains his incomplete study of a patient including the history taking.

Dr. Seham: I think I would like to discuss Dr. Evans' point, on the case history versus the questionnaire method. The case history represents the non-mechanized form of history taking. The questionnaire represents the mechanized. Which is better? Which ought to be used? I have had a little experience in comparing the two methods. For instance, when we first started to take histories in our heart clinic seven years ago by informal interview, without using any form, we got positive histories of rheumatic fever in children in 42 per cent of cases. From my reading and experience this seemed to be inadequate so I mechanized the history taking and developed a questionnaire which you probably have seen and with which we got 92 per cent positive histories in rheumatic fever.

Last week I asked nine students to take the same history on a child whose chief complaint pointed towards rheumatic fever. By the methods which they used which were various and slip-shod, there was not one student who learned that there were three other cases of rheumatic fever in the family. I believe they would have been more successful if they had followed a definite questionnaire, which we use routinely in the heart clinic.

The advantage of the mechanized method is especially noted in the interviews held with children affected with behavior disorders. I learn more about the health habits and the functional state of the individual child by the use of the questionnaire which I presented than when I just ask questions as the case may be.

James K. Anderson, M.D.,
Secretary.

PROCEEDINGS
MINNESOTA ACADEMY OF MEDICINE

Meeting of December 11, 1935

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 11, 1935. The meeting was called to order at 8 o'clock by the president, Dr. A. R. Hall. There were 47 members present.

Minutes of the November meeting were read and approved.

The president appointed a necrology committee consisting of Drs. Balfour, Braasch and Walters, to write a memorial to Dr. E. S. Judd.

Upon ballot, the following officers were elected for 1936: President, Dr. Thomas S. Roberts, Minneapolis; vice-president, Dr. E. M. Jones, St. Paul, and secretary-treasurer, Dr. R. T. LaVake (re-elected).

The scientific program followed:

VISUAL FIELD CONTRACTIONS AFTER HEAD INJURY

Hendrie W. Grant, M. D.
St. Paul

Dr. Grant read his Inaugural Thesis on the above subject and showed slides of visual fields in several cases.

Summary

Following head injury, contraction of the visual fields may be due to many causes. Some are purely neurologic, others appear psychic, and in still others both factors seem closely related. Contracted visual fields, simulating hysteric types in post-concussion syndromes, return to normal before cessation of other symptoms, and before settlement of the liability. They are explained as due to retinal congestion after vasomotor disturbance or to commotio retinae causing physiologic block of the light impulse. Visual field studies and hearing tests with the audiometer are valuable adjuncts in the study of head trauma and the post-concussion syndrome.

Discussion

Dr. W. E. Camp, Minneapolis: I was very much interested to hear Dr. Grant's paper. There was one thing I would like to mention and that is where there is a moderate degree of contraction of the visual fields, may it not be due to spasm of the retinal vessels rather than to the commotio retinae?

Dr. A. E. Smith, Minneapolis: There is one thing which I think is important in differentiating the psychogenic cases from those due to trauma or organic disease, and that is that the people with hysterical field contractions almost always get around well in traffic; whereas the organic cases, in which the fields are correspondingly limited, do not.

I was interested in what Dr. Grant had to say about petechial hemorrhages through the cortex following an injury which did not have skull fracture. They practically never occur in cases in which there is skull fracture; but are found in the fatal cases of brain injury in which the cranial case is intact.

Dr. Grant, in closing: In the past year there appeared an editorial in the Journal of the A. M. A. which took up the question of visual field contractions following head injuries and the statement was made that moderate contractions of the field are always of pathologic nature. They believed also that marked concentric contractions were probably hysterical. This reference was from a German publication. The work of Klar on the diastolic pressure in the retinal vessels appeared at a later date. There is no unanimity of opinion of the cause of marked contractions of visual fields as to whether they are organic or psychogenic in origin, but the opinion up to the past few years was that they were hysterical. We are now beginning to believe that these visual fields contractions do take place after trauma and are of organic origin. They can probably be differentiated by other symptoms, especially if vestibular and auditory are considered with them, as vestibular disturbance occurs in almost 100 per cent of the cases.

HEMORRHAGIC PURPURA

H. Z. Giffin, M.D.

Rochester

Abstract

My remarks are based chiefly on experience with sixty-two patients who underwent splenectomy for hemorrhagic purpura, between March 7, 1923, and December 1, 1935.

Five of these patients died in the hospital. At first sight, this postoperative mortality seems rather high, but it should be stated that all of these patients who died were operated on during an acute phase of the disease. In three of these five cases the condition was chronic; in the other two it was incipient. In reviewing the histories, it is likely that two of the three patients in the acute phase of chronic hemorrhagic purpura would not now be submitted to splenectomy. These two patients were in extremis when admitted and they did not improve on medical treatment. They had cerebral symptoms and were operated on in an emergency in the hope of preventing massive cerebral hemorrhage.

In addition to these five patients who died in the hospital, four others have died subsequently. One of these four died of lobar pneumonia two years following operation. The other three had conditions related to the disease, one of them dying of cerebral hemorrhage less than one year following speneetomy, one of hepatic insufficiency with jaundice seven years following splenectomy, and the third apparently of uncontrollable uterine hemorrhage at puberty five years after splenectomy. It is likely that this last patient could have been saved had it been possible to send her to a medical center.

The remaining fifty-three patients are alive and are either in fairly good or excellent condition up to twelve years following splenectomy.

Classification of Cases—The cases are grouped as follows:

Incipient of moderate severity	2
Incipient in acute phase	9
Chronic recurrent of moderate severity	39
Chronic recurrent in acute phase	12

This clinical grouping has been adopted in order to study more carefully the features of acute exacerbation during which the operative mortality is high. Incipient cases are those in which patients are suffering from their first attack of hemorrhagic manifestations.

In general, a study of the cases from this standpoint indicates that patients with incipient cases of moderate severity can be operated on with very little risk if the condition shows no tendency to spontaneous remission. Incipient cases in an acute phase have a high operative mortality, but if the patients survive operation, a satisfactory result is obtained. The most difficult group in which to make a decision with respect to splenectomy is that of chronic cases in a severe acute exacerbation. Patients with this type of the disease may be in extremis when seen, and, unless there is some response to transfusions, surgical treatment is likely to be of little avail; particularly is this true when cerebral symptoms are present, and I feel that patients of this type with cerebral symptous should not be submitted to splenectomy.

Pre-operative and Post-operative Duration—The preoperative duration of the disease varied from several weeks to fifteen years; in most cases it was two years or less. The post-operative period of observation has been up to twelve years in two cases, and from eight to twelve years in nineteen other cases.

Age and Sex of Patients—One patient was in the seventh decade of life. Nine were less than ten years of age. The largest number were between the ages of twenty and forty years. Forty-one patients were females, twenty-one males; in other words, 66.1 per cent were females.

Types of Bleeding—As would be expected, the most common types of bleeding were from the nose and gums and into the skin. However, about half of the female patients had excessive uterine bleeding, and in a third of the cases there was gastro-intestinal bleeding. In one out of ten cases bleeding was from the urinary tract.

Size of the Spleen—A study of the size of the spleen, corrected for age and sex of the patient, revealed that nine of the spleens were normal, fourteen less than

normal size. Only one spleen was exceedingly large. It is clearly not necessary to be able to demonstrate an enlarged spleen clinically in order to anticipate a satisfactory result from splenectomy. The smallest spleen weighed 30 grams, the patient being a girl six years of age; the largest spleen weighed 700 grams, the patient being ten years of age. The largest adult spleen weighed 550 grams.

Platelet Counts—Pre-operative platelet counts, made by the direct method using sodium citrate, averaged 75,000 per cubic millimeter. Platelet counts following splenectomy, up to twelve years afterward, averaged 193,000 per cubic millimeter. It is frequently stated that, after the initial increase in platelets following splenectomy, the platelet count becomes reduced to its former level. In my experience this has occurred in only a small proportion of the cases. Usually the platelet level is considerably higher on multiple counts following splenectomy than preceding it.

Recurrences—Recurrent bleeding has occurred in 35.4 per cent of the cases, and, for the most part, has been of mild degree. The highest perentage of recurrences has been among patients with chronic cases who were operated on in the acute phase of the disease. It has not infrequently been noted that mild recurrences have ceased and more severe recurrences have become less severe folowing the elimination of focal infection.

Conclusions—Patients with a chronic form of hemorrhagic purpura of mild severity are best treated by elimination of focal infection, an adequate diet, the administration of iron, and, if necessary, transfusions.

Chronic hemorrhagic purpura of the disabling type is best treated by splenectomy during remission.

Patients with chronic hemorrhagic purpura seen during acute exacerbations should be treated medically and given an opportunity to improve, at least temporarily, before splenectomy is performed. If their response is unsatisfactory, splenectomy may be necessary even though the operative risk is increased.

Incipient hemorrhagic purpura of short duration and of mild or moderate severity should be treated medically.

Patients with the incipient form of the disease which progresses in spite of medical treatment should be submitted to splenectomy without much procrastination.

Discussion

Dr. C. B. Drake, St. Paul: I am prompted to mention very briefly a case of the opposite condition which I recently encountered; that is, one with a very high blood platelet count. The patient was admitted to Ancker Hospital early this year with a count of over two million platelets on repeated examination, and one time as high as 2,500,000. She came in because of extensive subcutaneous hemorrhages. Her red count was 4,500,000 and leucocytes 35,000. At first she had little to complain of except these large areas of subcutaneous hemorrhages. There were at first no abnormal white cells except a very occasional degenerated megakaryocyte. However, after several months she showed numerous immature white cells which placed her very definitely in the leukemia group. A very high blood platelet count, therefore, as well as a low platelet count may have hemorrhage as an outstanding symptom.

Dr. M. H. Hoffman, St. Paul: The particular type of thrombosytopenic purpuras which present the greatest problem to the physician are those who never had hemorrhages before and develop an acute attack. One wonders whether or not to advise splenectomy even though the medical treatment brings about a cessation of the bleeding. I recall one patient who apparently recovered pretty well from the acute attack, then later had reduction of the thrombocytes with a brain hemorrhage and promptly died. The other patient was a thrombocytopenic purpura case for at least a week before I saw him. He was not put to bed and one day, on his way home from a last visit to the doctor's office, he had a severe headache. They could not get his own doctor and called me. He died of brain hemorrhage. The question is, just when should these patients be operated on? Should a splenectomy be done after the first attack, even though the thrombocytes are restored, to prevent accidents such as those just mentioned. I would also like to ask Dr. Giffin if he has had any experience with large doses of liver extract, fifteen to twenty times the amount given for pernicious anemia, and whether it has any effect on improving the number of thrombocytes.

Dr. S. Marx White, Minneapolis: One thing might be stressed in this connection, and that is the care with which the diagnosis of thrombosytopenic purpura should be made. I know that among practitioners of medicine as in this group there would be little likelihood for lack of care in developing diagnostic criteria for the diagnosis of the condition. At the same time we know that those studies are not always made. My reason for stressing care in diagnosis is that we are having in this part of the country now more cases of spotted fever of the infective type of the disease; not necessarily the fatal type as in the Bitter Root Valley, but the non-fatal types in which the fundamental condition is not a true thrombocytopenic purpura but an infectious disease with purpura. I think one should sound the warning that a case of purpura, simply because of purpuric manifestations, should not be put in this group and should not be operated on until a fundamental diagnosis is made.

Dr. W. E. Camp, Minneapolis: I would like to ask Dr. Giffin if any evaluation can be placed on the removal of foci of infection in the recovery of these cases?

Dr. Giffin: The case Dr. Drake describes brings up a question with respect to the past history. Is it possible that this patient formerly had had polycythemia vera?

Dr. Drake: My patient had been bled in November, 1934, at the out-patient department of the Ancker Hospital, presumably because of a suspected polycythemia, the reds at that time numbering 5,800,000 and the platelets over 1,000,000. She presented at that time an overproduction of red and white cells as well as platelets. The question arose, when I first saw the patient, of whether a diagnosis of thrombocythemia as an entity was justified. Later the blood picture became that of a myelogenous leukemia.

Dr. Giffin: Cases of polycythemia vera almost always have high platelet counts and, for some reason or other, the high platelet count persists even though the patient later becomes somewhat anemic. Dr. Drake's statement that a study of blood smears reveals evidence of immaturity is also consistent with the diagnosis of polycythemia vera in its advanced stages.

The question of whether or not to recommend splenectomy in the acute phases of either a chronic recurring case or an incipient case, is very difficult to decide; in fact, it is almost an impossible decision to make. My experience has led me to endeavor first to carry the patient through the acute phase, hoping that a remission will occur, but, if a favorable response is not prompt, the patient is submitted to splenectomy.

In reply to Dr. Hoffman's question, the administration of very large doses of liver extract intramuscularly has been tried without specific effect.

The question of the importance of focal infection can be argued pro and con. Experience seems to indicate, however, that in a high percentage of cases postoperative recurrences have ceased after the elimination of focal infection.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

NEWS ITEMS

Dr. E. H. Porter, Great Falls, Mont., has been reappointed a member of the State Board of Health.

Dr. L. F. Dugan has purchased the practice and equipment of the late Dr. P. A. Smith, of Faribault, Minn.

Dr. Robert has become associated with his father, Dr. G. J. Tweedy, of Winona, Minn., in general practice.

Dr. G. J. Leonard, St. Paul, has been appointed resident physician of the State Asylum at Hastings, Minn.

Dr. Walter Scott, formerly of Iowa City, has become associated with Dr. A. F. O'Donoghue, of Sioux City, Iowa.

Dr. R. H. Ray, Garrison, N. D., has a splendid record of having served as physician in that community for over thirty years.

Dr. Floyd S. Kidd, of the medical staff of the United States Veterans Hospital, Fort Snelling, died last month after a short illness.

Dr. C. A. Walters, Belle Fourche, S. D., was elected president of the Black Hills Medical Society, and Dr. J. H. Davis, secretary.

Dr. B. W. Kelley, Aitkin, Minn., has recently returned from a southern trip, bringing with him a bride, Miss Francis McClain, of Dallas, Texas.

Dr. Frederic Bass, engineering professor, University of Minnesota, has been elected to succeed Dr. N. G. Mortensen, St. Paul, as president of the state board of health.

The American College of Surgeons was established in 1913 by some 500 surgeons, leaders in every branch of surgery and representatives of all sections of the country.

Dr. Justus Ohage, former city health officer of St. Paul, died recently at the advanced age of 86 years. An obituary of the doctor will be found on another page of this issue.

The January meeting of the Yellowstone Valley Medical Society, held at Billings, last month, elected Dr. J. I. Wernham, president; Dr. J. C. Powers, vice-president, and L. G. Russell, secretary.

Dr. R. C. Rebman, Austin, Minn., died at Rochester, Minn., the result of an ear infection. Dr. Rebman was a graduate of Northwestern University and had been in practice at Austin for 25 years.

Final legislative approval by the Minnesota Legislature was given a bill validating selection of the Moose Lake site for the new $1,200,000 state insane asylum. The bill now awaits the governor's signature.

Dr. George R. Love, prominent physician and surgeon of Preston, Minn., died December 25 after an illness of over two years. Dr. Love was a graduate of the University of Minnesota in the class of 1910.

The Becker-Clay County Medical Society held its annual meeting at Detroit Lakes, Minn., and elected Dr. J. W. Duncan, Moorhead, president; Dr. A. R. Ellingson, vice-president, and Dr. L. H. Flancher, secretary.

The new officers for 1936, Stearns-Benton County, Minn., Medical Society, are Dr. D. W. Kohler, St. Joseph, president; Dr .J. P. McDowell, St. Cloud, vice-president, and Dr. J. N. Lilbert, St. Cloud, secretary.

The Northwest Medical Association held its annual meeting last month at Minot, N. D. Dr. P. H. Rowe, Minot, was elected president; Dr. S. J. Hillis, Berthold, vice-president, and Dr. J. R. Pence, Minot, secretary.

The Mt. Powell Medical Society held its annual meeting at Galen, Mont., and elected Dr. F. I. Terrill, president, and Dr. L. G. Dunlap, secretary. The new building devoted to patients of tuberculosis was also dedicated.

Dr. O. A. Oredson, who has been in active practice at Duluth for over 30 years, passed away on December 26 after many months of illness. Dr. Oredson had always taken a very active part in civic and medical affairs.

Dr. James C. Masson has been appointed chief of the surgical staff of the Mayo Clinic to succeed the late Dr. Edward Starr Judd. Graduated by the University of Toronto, Dr. Masson entered the Mayo Clinic as interne in 1912.

The Fourteenth annual Foundation Dinner of the Minneapolis Surgical Society will be held on the evening of February 6, 1936. Dr. Frank H. Lahey, Boston, an honorary member of the Society, will be the guest speaker.

Dr. G. E. Burnham, Carthage, was elected president of the District Medical Society at its annual meeting held at Huron, S. D., with Dr. W. H. Griffin, Huron, vice-president, and Dr. R. A. Buchanan, Huron, secretary.

The District Medical Society of Watertown, S. D., installed its new officers last month, with Dr. M. C. Jorgenson, Watertown, president; Dr. A. E. Wilkinson, Hayti, vice-president, and Dr. A. E. Johnson, Watertown, secretary.

Dr. A. P. O'Leary, one of the prominent physicians of Big Timber, Mont., died very suddenly last month at his office, the results of a heart attack. Dr. O'Leary was 65 years of age and a graduate of the University of Michigan.

Dr. A. M. Limburg was named president of the Cass County Medical Society at its recent meeting held at Fargo; Dr. J. C. Swanson, vice-president, and Dr. E. M. Watson, secretary. Dr. J. A. Myers, Minneapolis, was the guest speaker.

The annual meeting of the Rice County Medical Society was held at Faribault, Minn., last month when they re-elected Dr. J. M. Murdock, Faribault, president; Dr. O. P. Thorson, Northfield, vice-president, and Dr. C. J. Plonske, Faribault, secretary.

The Academy of Oto-Ophthalmology will hold its annual meeting at Billings on February 10 with the following speakers on the program: Drs. B. H. Hempstead, Rochester, Minn.; C. F. Coulter, Great Falls; L. G. Dunlap, Anaconda, and W. A .Morse.

The Steele County, Minn., Medical Society new officers for 1936 are: Dr. L. V. Berghe, Owatonna, president; E. Q. Ertel, Ellendale, vice-president, and Dr. J. F. Schaefer, Owatonna, secretary. The meeting was held at Owatonna, with a large attendance of members.

Preparations for the joint convention of the South Dakota Medical Association, the South Dakota Dental Association, the State Hospital Association, the State Nurses Association, and the South Dakota Pharmaceutical Association, to be held from May 4 to 7 at Sioux Falls.

The Camp Release Medical Society held its January meeting at Dawson, Minn., with two Minneapolis physicians as guest speakers. Dr. Myron O. Henry presented a paper on "Legal Pointers," and Dr. W. A. Fansler a paper on "Injection Treatment of Rectal Diseases."

The eighty-third annual meeting of the Minnesota Medical Association will be held in Rochester, May 4, 5 and 6. Clinics will be held each morning with lectures by nationally-known medical scientists. The American Thoracic Surgical Society will hold its annual sessions at Rochester on the same dates.

At the annual meeting of the district medical society held at Madison, S. D., the following new officers were elected: Dr. M. C. Tank, Brookings, president; Dr. V. A. Mokler, Wentworth, vice-president, and Dr. C. E. Sherwood, secretary. Dr. A. S. Rider, president of the state society, was the guest speaker at the evening banquet.

At the January meeting of the Seventh District Medical Society, held at Sioux Falls, two excellent papers were presented, one by Dr. T. J. Billion, on "Cardiac Failure and Treatment," the other by Dr. M. C. Howard, on "Cardiac Irregularities." Discussion of the papers followed by Drs. A. S. Rider, G. A. Stevens, F. C. Devall and R. W. Mullen.

The Winona County Medical Society, held its annual meeting last month at Winona, Minn., and after enjoying a fine dinner elected new officers for 1936. Dr. L. I. Younger, president; Dr. F. T. Benoit, vice-president, and Dr. I. W. Steiner, secretary. Dr. C. H. Watkins, of the Mayo Clinic, was the guest speaker, his topic being "The Diagnosis and Treatment of Anemia."

The third annual address in the Clarence Martin Jackson Lectureship of Phi Beta Pi Medical Fraternity, will be given by Dr. Russell L. Haden, of the Cleveland Clinic at 8:15 on Wednesday evening, February 5th, in the Medical Sciences Amphitheater at the University of Minnesota. Dr. Haden's subject will be "The Human Red Blood Cell." All who are interested are invited by the fraternity to attend.

The American Medical Association will broadcast during February, at 4 p. m., over the CST.

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presenting the following program: February 4th, Dr. W. W. Bauer, "Pneumonia"; February 11th, Dr. W. W. Bauer, "Home Hygiene"; February 18th, Dr. Morris Fishbein, "Heart Disease"; February 25th, Dr. W. W. Bauer, "Crippled Children." These programs may be heard in the Northwest over Stations WMAQ, WHO, WOW, and WDAF red network of the National Broadcasting Company.

The Minnesota State Medical Association broadcasts weekly at 10:00 a. m. every Monday over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker, William A. O'Brien, M.D., associate professor of pathology and preventive medicine, Medical School, University of Minnesota. The program for the month will be as follows: February 3rd, "Value of Colonic Irrigations"; February 10th, "Toothache"; February 17th, "Diet and Health," and February 24th, "Care of the Eyes."

Dr. G. M. Williamson, Grand Forks, secretary of the North Dakota State Board of Medical Examiners, reports the following list that have been licensed to practice medicine and surgery: Hal E. Freeman and Norval O. Brink, Bismarck; John P. Bartle, San Haven; Paul Ittkin, Tolley; Cyrus O. Hanson and Lorance T. Krogstad, Minot; Albert H. Keefer, Marquette, Mich.; Kenneth P. Malvey, Bottineau; William J. McGee, Larimore; Henry Harmon, Sharon; Ira D. Clark, Grafton, and Harvey J. Skarshaug, Fargo.

The Minnesota Radiological Society held its winter meeting at the Nicollet Hotel, Minneapolis, Saturday, December 14th, with the following program being presented: "Radiation Therapy of Carcinoma of the Lip," A. L. Abraham and W. K. Stenstrom, Minneapolis; "Roentgen Study of the Results of Epiphyseal Injuries," Oscar Lipschultz, Minneapolis; "The Dangers of Reducing Fractures Under the Fluoroscope," E. T. Leddy and C. A. Stevenson, Rochester; "Demonstration of Some Bone Changes in Children," M. J. Shapiro, Minneapolis; "Roentgen Study of Spontaneous Internal Biliary Fistula," C. N. Borman, Minneapolis; "Experiences with Roentgen Therapy of More Than 3,000 R in One Month," W. K. Stenstrom and Lewis Jacobs, Minneapolis, and "Combined Heat and Roentgen Therapy of Tumors—Review of the Work of Stafford Warren and Associates," C. O. Hansen, Minot, North Dakota. The next meeting of the Society will be held in St. Paul in March.

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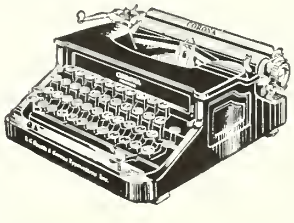

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The JOURNAL LANCET

Minneapolis, Minnesota
March 1, 1936

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New Series

The Mechanism of the Paroxysm in Bronchial Asthma

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THE nature of the dyspnea in asthma has been the subject of controversy ever since the recognition of this symptom-complex as a clinical entity. Numerous theories have been advanced as to the cause of the paroxysmal seizures of labored breathing which characterize this condition. Present-day authorities on the illness have agreed that the difficulty in respiration is mechanical and consists of an interference with the excursion of air through the respiratory passages. Furthermore, these writers believe that the site of the obstruction lies in the bronchioles and not in the larger branches of the respiratory tree. As to the nature of the block, however, there is a wide diversity of opinion. There are some who think that the occlusion is brought about by a plugging of the bronchial tubes by mucus and the other elements of asthmatic sputum, such as spirals, crystals, and epithelial cells. Most other authorities minimize the importance of this factor and consider it secondary in significance to the actual narrowing of the lumina of the bronchioles. Today a controversy is being waged concerning the mechanism which is responsible for the reduction in the diameters of these air passages. The majority of workers believe that the dyspnea is induced by stenosis of the air passages resulting from spasm of the muscles in the walls of the bronchioles. Directly opposed to this idea are those who strongly support the theory that edema of the lining mucous membrane is largely responsible for the diminution of the bronchial diameters. The latter viewpoint seems more logical to the writer for reasons which he will attempt to summarize briefly.

The arguments which can be presented in favor of the bronchial constriction or muscular spasm theory of bronchial asthma are the following:

(1) Bronchial constriction can be experimentally demonstrated in the lungs of experimental animals as a result of vagus stimulation.

(2) In asthmatic lungs, it is often possible to demonstrate hypertrophy of the bronchial muscles, which suggests that there has been excessive muscular spasm.

(3) Anaphylactic shock in the hypersensitive guinea pig is the result of broncho-constriction and resembles in many respects the paroxysmal dyspnea in asthma which is also, in many instances, based upon a hypersensitiveness. Associated with anaphylaxis in the guinea pig is a marked emphysema of the lungs resembling that found accompanying the asthmatic paroxysm in humans.

A casual survey of these arguments might seem to be convincing, but a more detailed analysis finds them inadequate in many respects. The fact that bronchial constriction has been demonstrated as a physiologic phenomenon, cannot be accepted as proof that this is the actual mechanism in bronchial asthma. Moreover, no definite relationship has been established between vagal disorders and bronchial asthma. The earlier concept of "vagotonia" or abnormal vagus irritability as the etiologic basis of asthma has been set aside by most writers in view of the fact that evidence of a "sympatheticotonia" is also frequently found in these cases. In fact disturbances of this nature seem most frequently to involve both sets of nerves ("heterotonia" or "amphotonia"). Although such instability of the involuntary nervous system is a common accompaniment of bronchial asthma, no definite etiologic relationship between the two conditions has as yet been established.

The argument that the bronchial muscles are hypertrophied in asthma is deserving of more serious consideration. That there is thickening of the muscular layers in the walls of the bronchioles in asthma was proved with actual measurements by Huber and Koessler[1] and later confirmed by Kountz and Alexander.[2] They found that other parts of the bronchial wall, particularly the subepithelial layer and the glands, also showed increases in thickness. Unfortunately, most of the control measurements in these studies were made on non-bronchitic cases. These workers, therefore, failed to eliminate the possibility that the muscular hypertrophy which they were measuring was the result of excessive coughing and of the increased work associated with the labored respiration in asthma. There are many authorities who believe that in these types of dyspnea, part of the mechanical function of breathing may be taken over by the muscles of the respiratory passages.[3] Huber and Koessler reported on two cases of chronic bronchitis which they excluded from consideration in their protocols because the diagnosis of asthma was in doubt, but which revealed muscular hypertrophy almost as pronounced as those cases in which the asthma was the outstanding symptom. Under the circumstances, one may question the justification of attributing the hypertrophy of the bronchial muscles to spasm alone and thus ignoring the effect which the exertion of labored breathing and excessive coughing may have had on the overdevelopment of these muscular tissues.

The analogy between the anaphylactic lung of the guinea pig and the asthmatic lung in the human is also unsound. It is true that there are features common to both of these phenomena. The dyspneic paroxysms in both may be precipitated by immunologic reactions resulting from exposure by the injection, ingestion, or inhalation of antigens for which specifically sensitizing antibodies are present in the body. Emphysema is associated with the attack in both. Eosinophilia is usually present in both phenomena. There are other similarities of less importance. All of these resemblances are more apparent than real.

Anaphylaxis in the guinea pig, as in other laboratory animals, is a state of hypersensitiveness which is mediated by the anaphylactic (precipitin) antibody and in which the shock tissues are the non-striated muscles. The reaction between the antigen and antibody occurs in the bronchial muscles and simultaneously in the other smooth muscles of the body, particularly in the uterus and the intestines where it may be regularly and easily demonstrated. In bronchial asthma in humans, however, the anaphylactic antibody has rarely if ever been found. Never has it been proved to be the etiologic antibody in this illness. Moreover, no particular affinity has ever been demonstrated between the precipitin antibody and unstriped muscle in humans, nor has it ever been proved that these tissues in man can act as the shock tissue for the anaphylactic antibody-antigen reaction.

The only antibody which has thus far been demonstrated in bronchial asthma is the skin-sensitizing antibody known as the atopic reagin. The affinity of this antibody for the skin was first demonstrated by Prausnitz and Küstner,[4] who were able to sensitize locally the skin of normal individuals by the intracutaneous injection of the serum taken from patients who manifested positive cutaneous reactions to an antigen (allergen). Never has anyone demonstrated the fixation of atopic reagins by the bronchial muscles, nor is there any clinical evidence that such fixation occurs in any muscles of the body.

The presence of emphysema in both forms of dyspnea has little theoretical significance as this finding may accompany any diffuse type of obstruction in the bronchioles, regardless of its nature. Likewise eosinophilia may occur in many different types of hypersensitiveness. In view of these facts, the anaphylactic theory of asthma shows many weaknesses. The main premises on which the theory of muscular spasm is based can hardly be considered theoretically sound.

The theory of mucous membrane edema seems to be more satisfactory for the following reasons:

Bronchial asthma is one of a group of atopic diseases, which are closely related to each other and are apt to occur simultaneously or in succession in the same individual. A particular hereditary predisposition to one or all of these illnesses is responsible for their appearance in any individual. Foremost among the conditions included under atopy are hay fever, asthma, atopic eczema, urticaria, and angioneurotic edema. The investigations of Coca, Cooke and their associates, and others have long since established the hereditary nature and interrelationship of hay fever and asthma. There is good reason to believe, therefore, that these illnesses are similar in nature and information about one may shed some light on the other. As the upper respiratory tract is involved in hay fever it permits of investigations which are impossible on the less accessible bronchioles in asthma.

Studies in hay fever demonstrate that in this illness the mucous membrane is the primary shock organ. There is no evidence anywhere of smooth muscle involvement. In unpublished slit-lamp studies of the sensitive and passively sensitized ophthalmic conjunctivae made by Feldman, Sherman, and the writer, no evidence of muscular contraction was noticed even in the arterioles of the conjunctivae. Dilatation of the vessels was noticeable from the onset. Edema was the outstanding characteristic of the hay fever reaction in the eye. Moreover the same workers[5] were able to passively sensitize specifically the occular conjunctivae of normal individuals by the subconjunctival injection of blood serum taken from sensitive cases. The affinity of the atopic reagins for the ophthalmic mucous membranes was thus experimentally established. In a similar unpublished study by Kaplan, Sherman and the writer, the nasal mucous membranes in a series of normal individuals were passively and specifically sensitized. Here again the reaction was typically that of edema of the mucous membrane. Gray and the writer in unpublished studies on the intestinal and rectal mucous membranes were likewise able to demonstrate passive specific sensitization of these tissues by local injection of a reagin-bearing serum. The reaction to the specific antigen in these cases again manifested itself as a marked edema of the mucous membranes with increased peristalsis in some cases as a result of the mucosal irritation. In some of these studies, the antigen was applied to the sensitized site by direct application or injection, in others by ingestion or by subcutaneous or intravenous administration. The resulting reaction was always the same. These experiments demonstrated the general ability of the ophthalmic, nasal, and intestinal mucous membranes of practically all normal subjects to fix atopic reagins and to respond to subsequent specific stimulation with the antigen by local edema formation. Are we not justified in assuming, therefore, that the bronchial mucous membrane would behave like all the others, that it would similarly fix reagins and that the response of such a sensitized mucous membrane to contact with the specific antigen either by inhalation or through the circulation would be edema as it is in every other similar tissue which has been so treated and tested?

The possibility must be entertained that, as a result of the irritation of the bronchial mucous membrane, there may be a secondary reflex spasm of the bronchial muscles as sometimes occurs in the intestines. It is important to recognize that the muscular contraction in these cases is not the primary reaction nor a necessary accompaniment of it. Above all, it is significant that the antigen-antibody reaction takes place in the mucous membrane and not in the muscle as it does in the anaphylactic guinea pig.

The edema theory of asthma is more in accord with the concept of atopy than is the muscle spasm theory. In other examples of atopic illnesses, such as hay fever, angioneurotic edema, and urticaria, edema of the skin and mucous membranes satisfactorily explains all the lesions. In atopic eczema, the serous exudation involves the top layers of the skin and, therefore, affords no opportunity for accumulation of fluids in the tissues.

In the last five years, advances in the medicinal treatment of asthma have, for the most part, tended to strengthen the edema theory. The immediate relief afforded to asthmatics by one or two inhalations of a fine adrenalin spray[6] can best be explained by the local shrinking of the turgid mucous membrane of the bronchioles, by the adrenalin. The beneficial effects of the intravenous injections of hypertonic solutions, such as glucose, may also be attributed to withdrawal of fluids from the edematous lining of the bronchioles. Likewise the increase in the use of various diuretics and anti-edemic medications during the past few years points in the same direction. It is also of passing interest to note that atropine and its derivatives which have always been recommended in asthma because of their paralyzing effect on the vagus endings are being discarded by most clinicians as of little practical value in the treatment of this illness.

The nature of the asthmatic attack still remains a debatable question. Considerable work will be needed before the experimental demonstration of the dyspneic paroxysm in humans will be an accomplished fact. One cannot, however, escape the impression that in the last decade the most important contributions have pointed away from the theory of muscular spasm and have tended to support the concept that the cardinal factor in bronchial asthma is the narrowing of the lumina of the bronchioles as a result of swelling of their lining mucous membranes.

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Gastro-Intestinal Allergy*

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GASTRO-INTESTINAL allergy is probably the most common cause of alimentary symptoms. The writer's[1] emphasis of such disturbances in the last ten years was preceded by several articles by Duke and Andresen in the early twenties and by discussions of gastro-intestinal allergy in children, especially by Schloss, and by Laroche, Richet, Saint Girons. In recent years, Andresen,[2] Vaughan,[3] Presson and Wilson,[4] Alvarez,[5] and Gay[6] have continued to stress its frequency. Friedenwald[7] also has ascribed to the variety of its manifestations. As with asthma, eczema, or migraine, the predisposition to develop gastro-intestinal symptoms often exists as a familial tendency. Food is by far the most common cause of allergic disturbances in the alimentary tissues. Occasional symptoms probably arise from inhalant allergens, especially pollens, and bacterial allergy has been an hypothecated cause for many years, though it is hard to substantiate with adequate clinical proof. The many disturbances from food allergy in the mouth, oesophagus, stomach, small intestine, colon, and rectum, however, are well established. Moreover, the effects of allergy on the liver, biliary system, and appendix are being described, and allergic reactions probably arise in the pancreas and its ducts which as yet have not been recognized clinically. Edema and smooth muscle spasm, moreover, may occur in the genito-urinary tract. Ascites from food allergy apparently occurred in one of my patients who had severe gastro-intestinal allergy.

Experimentally we know that mucous membrane edema and congestion, and hyperactivity of glands and smooth muscle spasm result from allergy. Any part of the extensive mucosa, smooth muscle, and glandular tissues of the alimentary tract may become hypersensitive. Moreover, smooth muscle spasm, edema ,and changes in permeability of the vascular tissues especially of the arterioles and capillaries occur in the allergic reaction and may lead to tissue edema and to petechial or gross hemorrhages in the stomach, intestines, liver, as from experimental anaphylactic reactions.

Allergic reactions in gastro-intestinal tissues probably arise most commonly through hematogenous borne allergens from ingested foods. Varying areas and amounts of the alimentary tissues are hypersensitized to the causative allergens which explains the varying combinations and character of symptoms in patients affected with gastro-intestinal allergy. In addition to the hematogenous type of reaction, undoubtedly superficial sensitization in the mucosal tissues in varying parts of the alimentary tract occurs, and gives rise to contact reactions when the causative food proteins reach the sensitized areas during their progress through the intestinal lumen. Localized hyperemia associated with tissue edema and possibly extensive congestion or smooth muscle spasm may thus arise and result in localized abdominal soreness and possible pain. Unfortunately visualization of such effects of alimentary food allergy is not possible, though the results of localized allergy in the mouth, pharynx, rectum, and sigmoid substantiate this type of reaction and it is to be hoped that with the gastroscope, a study of gastric allergy will soon be forthcoming. The peritoneoscope may also afford interesting information in gastro-intestinal allergy. Thus such congestion and erythema may be compared to contact eczema. It is possible that such local reactions may become persistent and associated with definite mucosal and even with tissue changes comparable to those in the skin. Such lesions, moreover, would require days or even weeks to disappear after causative allergens are eliminated, and it is possible that some tissue changes might persist indefinitely as a result of repeated chronic allergic reactions. The allergic origin of canker sores and probably of certain peptic ulcers will be discussed below. Such lesions can be explained either as urticarial-like or Arthus-like lesions in the mucosa, and it is probable that similar lesions may arise in the rest of the intestine and colon.

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The time of the onset of symptoms after the ingestion of a food depends on many factors. First the degree of allergy in the affected areas in operative. The immediate nausea, vomiting, and less frequently immediate diarrhea and colonic or intestinal cramping arise either from marked contact reactivity or more likely from the rapid entrance of minute amounts of the specific food allergens into the blood from the oral, oesophageal or gastric mucosa, and their hematogenous transmission to the cells in the areas of the alimentary tract wherein the marked localized sensitization exists. Second: If contact allergy in the mucosa is present, symptoms will not arise until the specific foods as they pass down the alimentary tract have reached the sensitized areas. Thus rather immediate reactions may occur in the mouth, oesophagus or stomach, and more delayed symptoms arise in the small intestine, cecum, and especially in the rest of the colon and rectum. It would seem that increased permeability of the localized areas of the gut also explains certain constitutional effects of food allergy. In one patient it requires about 17 hours before nausea, vomiting, prostration and headache arise after the ingestion of garlic. Third, allergic reactions occur in affected tissues in many patients only after the causative foods have been eaten a number of days in succession. At times ingestion of such foods for several weeks is necessary before the existing desensitization or tolerance is broken down. Operative at all times moreover is the factor of the total dose of the causative food. Small amounts are better tolerated than large or excessive quantities, and the allergenic effect is most marked when the food is ingested alone or in an empty stomach.

The tendency to recurrent attacks of symptoms especially from food allergy must be remembered. Asthma due to such allergy especially in childhood is usually recurrent and allergic migraine due to food sensitizations is cyclic in nature. In the same fashion, certain gastro-intestinal symptoms and especially cyclic vomiting of youth due to food allergy has similar recurrent tendencies. This is probably due to the establishment of a refractory or desensitized state after the acute explosive allergic attack has occurred.

Manifestations

In former publications[1] the writer has presented statistical data indicating the frequency of various symptoms arising in different areas of the alimentary tract from food allergy. It has always been stressed that similar symptoms may arise from other causes such as achylia, peptic ulcer, cholecystic, hepatic and pancreatic disease, colitis of various types, appendicitis, new growths, bands, adhesions, and anomalies, rectal and anal disease, herniae, psychoneurotic disturbances, carbohydrate intolerance, metabolic and cardiovascular disorders and other less common diseases. Thus before food allergy is too definitely considered as a cause of symptoms, it is most important to execute all physical and laboratory examinations including thorough roentgen ray studies which will rule out any such pathology or disease. In the following summary of symptoms, those which may result from food allergy will be discussed. As mentioned before, inhalant allergy and probably bacterial allergy produce occasional disturbances but they are of minor importance compared with those arising from food sensitizations.

Burning of the mucous membrane of the lips, mouth, pharynx, oesophagus, and of the stomach frequently arises from food allergy. Such burning is often associated with erythema, induration, and even with subsequent superficial exfoliation of mucosal cells, and may be followed by the formation of localized whitish membranes. Small areas of erythema with infiltration and resulting soreness also occur especially on the tip and sides of the tongue. A coated tongue should always suggest as one cause localized gastric, intestinal, or colonic allergy, which has upset the intestinal gradient and thus produced reversed peristalsis. Heavy breath frequently disappears when the patient is on a proper elimination diet. The canker sore or aphthous stomatitis is usually due to food allergy. These lesions may occur on the lips, causing swelling, infiltration, and prolonged soreness and may even be associated with similar lesions in the nasal mucosa near the borders of the alae, and extending on to the upper lip. Canker sores, moreover, may involve the pharnyx and oesophagus. Frequently they may recur in one area of the cheeks, gums, or lips. One patient had large canker sores on the left side of the buccal mucosa near the gum margin, whenever the slightest amount of prune was ingested. Often the allergic reaction was extensive and deep, leading to an actual necrosis of tissue resulting in subsequent discharge into the mouth of necrotic material. Canker sores arising from allergy are due either to urticarial-like lesions, or to Arthus-like necroses in the mucosa. Fruits, especially in the fresh state, or nuts are frequent causes, though wheat, milk, and egg, or any other ingested food or drug may be at fault.

Small or large circumscribed edemas of the lips, tongue, or pharynx arise from allergy. Food is again the most common cause of such angioneurotic edema, although bacterial allergy must receive definite consideration, especially in adults. Since such swelling may occur in the oesophagus, it offers one explanation at least for globus hystericus. Actual difficulty with swallowing does occur in some patients, and substernal pressure and fullness may result. It is also probable that allergic smooth muscle spasm in the oesophagus occurs from food allergy.

The gastric tissues are too often the site of food allergy. Superficial erythema and congestion, diffuse or localized similar to that observed in the mouth frequently arises. Patients gradually can determine specific foods which produce such mucosal reactions giving burning and possibly the sensation of heaviness, weight and gastric consciousness. Smooth muscle spasm in localized areas or throughout the stomach wall may arise from allergic reactions, or may possibly result from mucosal congestion and edema. Allergy, of course, affects the cells of the gastric glands and accounts for excessive mucus and probably disturbs acid and pepsin production, though no definite proof of such effects is as yet available. Eosinophiles should be sought in gastric secretions as confirmatory evidence of gastric allergy. It is readily appreciated that mucosal and glandular congestion and smooth muscle spasm can explain the gastric unrest and impaired gastric digestion which leads to belching, regurgitation, distention, sour stomach, nausea, vomiting, gastric soreness and even pain which may arise from gastric allergy to foods. The degree of such sensitizations determines the severity and the time of the origin of symptoms after the food ingestion. Spasm of the pylorus in infancy is frequently due to food allergy, and it is probable that actual stenosis which requires surgical intervention may at times arise from this cause. The writer[8] has reported gastric retention in several adults due to food allergy which was relieved with the elimination of causative foods from the diets. The tendency to mucosal and cutaneous bleeding in allergy may also explain some so-called idiopathic gastric bleeding. Moreover, gastric symptoms of all types may arise secondarily from disturbances in the intestinal gradient and reversed peristalsis arising from allergic reactions in localized areas in the small intestine, hepatic structures, appendix, cecum, and even in the large bowel which will be described later. The nausea, vomiting, anorexia, belching and other gastric symptoms which usually accompany migraine or recurrent headaches are usually indirectly due to food allergy, since this etiology is responsible for the majority of such headaches. Finally the cyclic vomiting of youth which is gradually being recognized as an equivalent of migraine is another indirect result of food sensitizations.

Increasing evidence indicates that peptic ulcer may frequently be due to lesions similar to canker sores in the mouth, which are increased in degree and size and prevented from healing by the continued action of the gastric acid and pepsin. Several Italian investigators,[9] moreover, have shown that gastric incisions in sensitized animals go on to ulceration when the animals are fed proteins to which they are sensitized. The writer[14] has described symptoms suggestive of ulcer which have been relieved by the elimination of allergenic foods and among others has studied patients with symptoms from actual ulcer which have persisted until foods such as milk which were productive of allergy were removed from the diet. Carr reported a patient whose ulcer symptoms arose from milk and who had a fever of 104 degrees of allergic origin whenever milk was taken. Gay[10] recently has become convinced of the frequency with which peptic ulcers are due to food allergy. Rinkel, Beecher, and Lintz have also discussed this problem. Thus in this disease of obscure etiology, the possibility that canker sore like lesions due to food allergy are a common cause, must receive increasing consideration, not only in the medical therapy, but post-operatively when surgery has been necessary. The recurrent ulcers after surgery, particularly of the gastro-jejunal type may be of less frequent occurrence when food allergy is given due consideration. The ulcer-diathesis may be due to allergy.

Hepatic and biliary allergy from food and probably from bacteria accounts for many symptoms in these tissues. This is not surprising since food allergens absorbed into the blood from the intestinal tract immediately course through the vascular channels of the liver. Such hepatic allergy is probably associated with edema, consequent swelling of the liver, pain and soreness and may result in transient jaundice, and disturbed digestive function. Chronic allergy may be one cause of cirrhosis. Pain of varying degrees may also occur in the biliary structures including the gall bladder from allergy. The writer has reported several cases with symptoms suggesting gall bladder disease which were due to food allergy, and Alvarez has affirmed such pseudo-cholecystitis. Graham has emphasized the necessity of considering food allergy as one possibility in the differential diagnosis of all symptomatology in the upper right quadrant. Duke and others have stated that allergic congestion in the mucosa of the gall bladder or appendix may predispose to infection or other pathology, and it is to be remembered that pathology and allergy may co-exist and need equal consideration if symptoms are to be satisfactorily controlled. No definite evidence exists in the literature, moreover, of obstructive allergic edema of the biliary ducts leading to severe pain or temporary obstructive jaundice, though such swellings could occur. It is also possible that recurrent allergic reactions throughout the liver might at times be responsible for the intermittent nausea and vomiting of so-called abdominal migraine and it is also possible that such a disturbance could accompany the cerebral edema or vascular spasm which is at present assumed to be causative of the headache of severe migraine.

In the small intestine, mucosal and smooth muscle reactivity in varying and localized areas, angioneurotic edema, and persistent localized contact reactions are probably responsible for disturbances in peristalsis with resulting nausea, vomiting or anorexia, and for localized soreness, tenderness, cramping, hyperstalsis with diarrhea, which are frequent manifestations of food allergy in these tissues. Idiopathic hemorrhages or bleeding and excessive intestinal mucus may also be of allergic origin. Symptoms of intestinal obstruction even with accompanying leucocytosis and fever may arise and lead to unnecessary surgery. At operation the allergic bowel presents a congested or edematous appearance. Localized swellings may be palpatated and sterile free fluid in the abdominal cavity has been frequently encountered. In the future, study of such fluids for eosinophiles should be made. Allergy in the small intestine and in the stomach and probably the colon occurs in patients with the gastro-intestinal, joint, and cutaneous symptoms, frequently associated with purpura of the skin, and at times of the mucous membranes which have been described by Osler, Christian, and recently by Trimble, and which have been shown by Eyermann, Alexander, Kahn and the writer frequently to arise from food allergy. This syndrome was first described by Henoch and Schörlein.

Appendiceal allergy from food and probably from bacteria is of common occurrence. The writer is convinced of the frequency of allergy in the cecum, and such reactivity undoubtedly extends into the appendix. Edema and congestion leads to enlargement and probable obliteration of the lumen and repeated or persistent allergy may produce chronic tissue changes. Such congestion undoubtedly predisposes the appendix to infection and may be the original cause of many cases of acute appendicitis which demand surgery. It is even possible that Arthus-like lesions or urticarial areas arise which lead to necrosis which is complicated with infection. The differentiation between an allergic and an infected appendix is a constant challenge to physicians. Many appendices have shown eosinophilic infiltration in a surprising number. The mistake must not be made, however, of assuming an allergic appendix when real infection is present. Because of the liability to infection, moreover, the appendix which becomes the seat of recurrent allergic reactions might best be removed.

Colonic allergy especially to foods is very frequent. As previously stated, localized sensitization in the cecum and ascending colon are apt to arise, probably due to the comparative rapidity with which ingested food reaches this area and the retention of such food in this part of the colon. That such allergy is often of the contact type has already been expressed. Fruits of all types, especially when fresh seem to produce frequent cecal allergy, possibly due to their tendency to increase peristalsis and their consequent rapid arrival in the first part of the colon. Moreover, the tendency to overeat of fresh fruit is a factor. But other foods, especially when eaten in excessive amounts or alone may result in such localized sensitizations. Thus cecal allergy is responsible for much lower right quadrant soreness, distention, and even pain, and often explains the lack of relief from appendectomy. Tenderness and pain around abdominal scars have been found by the writer to result from persistent food sensitizations. Smooth muscle spasm may accompany mucosal reactions, or may predominate in the causation of symptoms leading to stasis and cramping and persistent pain in the ascending colon. Localized soreness, pain and cramping likewise may arise in the transverse or descending colon and in the sigmoid and rectum, at times resulting in hyperperistalsis with diarrhea. More frequently smooth muscle spasm in the varying parts of the colon may give rise to spastic constipation. Thus allergy as one cause of constipation needs special emphasis, not only in adults but also in children. A family history of constipation stresses food allergy as a likely possibility. The tendency for allergy to produce hyperactivity of mucous forming glands points to the fact that mucous colitis as Vaughan reported is frequently of allergic origin. Constipation due to allergy is often accompanied by varying amounts of mucus, the presence of which should always suggest the possibility of hypersensitiveness. It is important to emphasize that localized allergy in different parts of the large bowel often produces sudden attacks of severe cramping, pain or persistent soreness which are difficult to explain. Such spasm has been visualized by the roentgen ray, by Eyermann, Duke, Gay and the writer. One woman of 58 years had had nearly constant pain in the upper left abdomen, the cause of which had eluded careful study for several years. Finally the gall bladder was removed though no definite pathology had been found by roentgen ray. Thereafter her pain became more constant and had kept her awake most nights for months. My history revealed a previous story of severe recurrent headaches. Her daughter had an acneform dermatosis on her face, controlled with elimination diets. A selected elimination diet was prescribed, and complete relief from abdominal pain was obtained in three weeks. Her allergy was probably confined to her splenic flexure. Another patient was always awakened between 2 and 4 a. m. by left-sided abdominal pain which was relieved with the proper elimination diet. Still another man had left-sided abdominal pain which was thought to be due to adhesions around the colon and later was relieved by the removal of allergenic foods and reproduced when they were again eaten.

It must be pointed out that the so-called unstable or irritable bowel is a frequent manifestation of allergy. Such irritability should always receive adequate and prolonged study from the allergic viewpoint which, of course, necessitates diet trial with the elimination type of diet modified if desired by positive skin reactions. The common conception that neuroses and mental strain and worry or that roughage are usually responsible should only be adopted as an explanation in the patient after every possibility of an underlying food allergy has been expertly studied. In the irritable bowel especially the probability of chronic allergic lesions must be considered which requires prolonged and complete elimination of the causative foods before a return to normal tissue structure and function can be expected. The time required for the cutaneous eczema to disappear after the allergenic foods have been removed is illustrative of this idea. Moreover, as in allergic eczema, allergic reactions in the intestinal mucosa, especially in the colon may be complicated with superimposed infection and influenced by irritative, chemical and physical factors. The recent demonstration that nasal polypi are practically always of allergic origin suggests that certain polyps in the colon may arise from a similar cause. Whether extensive colonic polyposis may originally be due to an underlying allergy must also be considered. Finally the proctologist encounters many disturbances which may arise from localized allergy. Tenesmus,[11] pain and irritability of the rectum, mucosal congestion and canker-like lesions may be due to this cause. Spasm in the anal sphincters may arise from allergy and at times predispose to hemorrhoids. Pruritis ani frequently results from a localized eczema due to food or contact allergy similar to the vulval and perineal lesions and congestion which arise from allergic reactions. This brief discussion can only emphasize the possibilities of colonic allergy in the production of abdominal symptoms and predicts the increasing realization of its frequency as a wider and better knowledge of its causes and pathology develop during the coming years.

Etiology

As already stated, food allergy is the most frequent cause of the alimentary manifestations which have been described. The intimate and prolonged contact that food has with its mucosa makes it the most logical cause of such allergy, and the gastro-intestinal tract as the most frequent site of its effects. As with all other allergens, those foods which are eaten most frequently and in largest amounts must always be under suspicion. Moreover, those foods which may be eaten occasionally, especially in the fresh state with intervening long periods of abstinence such as shell fish and fresh fruits, tend to produce gastro-intestinal allergy. This may be especially frequent when they are eaten alone. Moreover, it is probable, though difficult to actually prove, that foods are most likely to establish sensitizations during periods of indigestion especially in children. It has also been suggested without adequate substantiation that impairment in hydrochloric acid, pepsin, and pancreatic ferment production may predispose to food allergy.

Occasionally ingredients in drinking water produce alimentary allergy. The possibility of such reactions from chemical constituents such as calcium, iron, or chlorine has been indicated in the literature and in the writer's experience. One patient had marked intestinal pain and soreness from a certain deep well water, and not from surface city water. The fact that organic substances in water such as algae, parasites, other vegetable matter, pollens, allergens from shell fish or fish, and similar substances may yield allergic reactions in the alimentary and other tissues must always be remembered. Chemicals sprayed on fruit and vegetables and dyes used in foods, rarely may yield trouble. Finally, ingested drugs of all types may produce allergic symptoms localized to small or extensive areas of the alimentary tract.

Inhalant allergens such as pollens may produce gastro-intestinal disturbances. These undoubtedly are rare, but probably occur in a few individuals who have very marked sensitizations. Pollen toxaemia which is seasonal in occurrence and not especially uncommon, may be associated with mild gastro-intestinal symptoms. Alimentary symptoms occasionally arise during pollen therapy and may also occur from other injectant allergy such as that from sera, insulin, glandular extracts, and other medicaments given by vein, subcutaneously, or intramuscularly.

Morris, Wherry, and many other students have described gastro-intestinal symptoms of all types and toxaemia from bacterial allergy. It has been thought that bacteria in the colon especially have been responsible though bacteria from other tissues have been blamed. Separate cultures of bacteria recovered from the stools and less often from the gall bladder and other foci in the body have been prepared and desensitization has been conducted with minute and increasing doses of these organisms which have given positive skin reactons. The true evaluation of such intradermal tests is still in debate and wide confirmation of the frequency of such bacterial gastro-intestinal allergy is not published. However, many patients apparently have been benefited by such therapy and it is justified after other pathology has been ruled out. It is possible that the more common food allergy is fundamentally responsible for symptoms in some patients assumed to have bacterial allergy. Foreign literature especially and Niles and Torrey[12] and Mateer[13] among others in this country have emphasized the frequency of allergy to autogenous and stock colon bacilli, especially of the hemolytic type. Thus bacterial allergy as a cause of gastro-intestinal symptomatology must receive recognition and further controlled and accurate study.

Diagnosis

Food allergy[14] is usually, though not necessarily indicated by various points in the history. The occurrence of chronic indigestion, constipation, recurrent headaches, or cutaneous edemas in the family history or of any of these symptoms discussed in this paper occurring in the personal history should suggest the possibility of food allergy. Of great importance is the history of food dislikes and disagreements or of long standing anorexia without adequate explanation. The story of specific dislikes or idiosyncrasies frequently points to actual allergy to those foods though it often is explained by whims or imaginary disagreements.

Foods productive of immediate and often acute reactions in the alimentary or other body tissues are apt to be associated with skin reactions. It is therefore, justifiable to do scratch testing with allergens of all ingested foods. Subsequent intradermal testing with those allergens which have failed to react by the cutaneous test has yielded confusing and little additional information of value. Moreover, the value of positive skin tests must be affirmed with actual diet trial. As with other manifestations of food allergy, most foods productive of alimentary symptoms are not associated with skin sensitizing bodies. The symptoms which are late in appearance may result from cumulative effects from repeated ingestions or may be due to localized contact allergy in the mucosa. The reacting bodies may be confined to the shock tissues accounting for the negative skin reactions.

Thus as with all food allergy, trial diet is of greater importance than skin testing. Such dieting must be carried out with foods which rarely or infrequently produce allergy in average patients. For such purpose, my elimination diets[15] have been formulated and have found frequent use for the study and control of manifestations of food allergy. These diets should be modified by histories of food disagreements or dislikes or by definite scratch reactions to food allergens. If routine elimination diets are not remedial, supplemental diets containing a very limited group of foods, but with adequate protein, vitamins, minerals, and calories must be tried. Reactions to biologically related foods must be remembered. The tendency for fresh and even cooked fruits of all types and occasionally for many vegetables to yield gastro-intestinal allergy must be kept in mind. When weight reduction is undesirable, constant attention must be given to adequate caloric intake. Because of the fact that the reacting bodies to specific foods usually require from one to four or more weeks to be eliminated from the cells of the shock tissues, the trial diets must contain foods with which adequate and satisfying meals can be prepared. The writer[16] has always stressed the necessity of the prevention of any nutritional damage in the use of elimination diets. Great emphasis must also be placed on absolute strictness and adherence to the specified diet. The slightest deviation if repeated every few days may prolong symptoms indefinitely.

Inhalant and bacterial allergy must be remembered as diagnositic possibilities. Previous discussion has indicated the type of diagnostic study which must be followed in their investigation.

Treatment

Food allergy necessarily has to be controlled in order to be assurred of the etiologic causes. Thus as diagnosis proceeds and various foods are discovered which produce gastro-intestinal symptoms, treatment progresses. Moreover, because of the fact that it often requires days or weeks for symptoms to be relieved after the removal of a food from the diet and since symptoms often recur only after the causative food has been ingested for days, weeks, or even months, the gradual determination of the diet which produces the least gastro-intestinal allergy often requires many months. Certain patients, moreover, are sensitive in varying degrees to a great many or nearly all foods as others are to nearly all pollens. The first diets necessarily for such patients may have to contain foods which are only mildly allergenic. There is no sharp division, necessarily, between foods which are non-allergic and those which are allergic in many cases. In addition, the prolonged elimination of allergenic foods seems to be accompanied by increasing freedom from former symptoms and a steady return to normal health. This may be due to a gradual disappearance of cellular disturbances which have resulted from the prolonged chronic food allergy.

After the patient has learned the technic of testing new foods when he is practically symptom-free on a comparatively or absolutely non-allergenic diet, he can gradually try other foods in his diet. However, the tendency to forget that slight deviations gradually produce trouble, and that symptoms may not reappear for weeks after a new food has been constantly taken, makes it wise for the physician to admonish and advise the patient at frequent intervals for long periods. The writer, moreeover, has long described the detrimental effect that proximity to the ocean and probably to rivers and lakes at low altitudes has on food allergy. This effect is especially active between the approximate dates of September 1 and April 1. Such effect has also been observed in Europe, and explains why patients can eat foods during the summer months especially in high or dry areas without difficulty. Humidity, ionization of air, and barometric pressure do not explain this effect.

Desensitization may gradually arise with the continued elimination of the food from the diet. This may occur in a month, a year, five to ten years, or may never occur. Oral desensitization continues to be described and is worthy of trial. Hypodermic desensitization is rarely satisfactory. The use of acid and digestive ferment therapy has been of no aid in problems of food allergy except when indigestion from the lack of these essential substances has been present. Thus relief of symptoms is the reward offered for the necessary will power required to eliminate allergenic foods over long periods of time in the control of food sensitizations.

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Modern Methods in the Study of Migraine

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UNDOUBTEDLY the symptom complex which we know today as migraine is a phenomenon of remote antiquity. Possibly the trephining not inferquently observed in prehistoric skulls was performed at times for relief of this type of headache. We cannot be certain of this, however, since it was not until the first century of the Christian era that we find any record of serious attempts to distinguish this type of headache from the general group.

According to Balyeat, Aretaeus,[1] toward the close of the first century, described a particular type of headache, paroxysmal in character, one-sided, associated with nausea, and of more or less regular recurrence. He gave this type of headache the name heterocrania. Galen spoke of hemicrania although it is not certain that he was describing the same type of headache. The term migraine first appeared in the English medical literature in 1777. Modern recognition of the disease as an independent symptom complex dates from 1784 when Tissot described the condition in detail in his Dictionary of Medicine.

Explanatory theories of headaches probably date back nearly as far as man's personal experience with the malady. And through the centuries, the suggested etiologic factors have been indeed numerous. However, it is interesting that even at an early date some gastro-intestinal association was recognized. This undoubtedly was due to the frequent occurrence of nausea and vomiting. Thus, Galen believed that headache was a result of the irritation of the brain by black bile. Serapion in the eleventh century postulated a primary gastro-intestinal etiology, with the transportation of hot or cold effluvia from the intestines to the head.

As early as 1850 clinical investigators commenced to suspect a relationship between migraine and what we now term the allergic diseases. The great French clinician, Trousseau, 85 years ago, described migraine as a part of the so-called asthmatic diathesis, which included such other conditions as urticaria, eczema, hay fever and some forms of hemorrhoids (pruritus ani?). By this I do not mean that at that time a basic etiologic similarity or identity was suspected in the common denominator of these diverse diseases which today we term allergy. The only point made at that time was that these diverse diseases occurred frequently in the same individual or the same families and that sometimes there was evidence suggesting an hereditary factor. The clear conception of these early writers, however, has since been confirmed by the more recent developments in the field of allergy, developments which have demonstrated the possibility of a common fundamental basis for such apparently heterogeneous diseases. Indeed, today it seems probable that even gout in some of its forms has an allergic linkage. Even though this disease is admittedly a manifestation of disturbed uric acid metabolism and manifests itself by certain pathologic changes which are certainly not characteristic of the other allergic diseases, yet the fact remains that persons who experience gout from one type of wine find that they drink other types with freedom from symptoms. The possibility, of course, exists that these cases of so-called gout may actually be cases of arthritis.

Lyman wrote, in 1895, that gout and headache have something in common, especially the headaches which resemble hemicrania and occur with the catamenia. He also remarked on the frequent association of migraine and hay asthma with gout, or its occurrence in individuals who later developed gout.

It was but natural that with an understanding of uric acid metabolism and its disorders in gout, a uric diathesis would be proposed explanatory of migraine. Lyman's treatment of this symptom consisted in the administration of mercurial cathartics, antipyrine, caffein and alkali. He remarked that a glass of wine and a good dinner often relieve the headache because it drives the uric acid from the blood into the tissues.

Although there had been isolated opinions suggesting that food idiosyncrasy might play an etiologic role, such as that expressed by Brunton in 1885 who believed that milk and eggs might be responsible in certain cases, the turn of the century found research on the cause of migraine directed along quite a different line. This was the day of ptomaines and leukomaines and at that time it was widely believed that the cause of migraine had at last been discovered in paraxanthine, one of the leukomaines which had been demonstrated by Rachford and Wilson as being present in the urine of persons with migraine. Migraine was then considered to be an explosive neurosis caused by the presence of an autogenous toxin (leukomaine) in the blood.

The last thirty-odd years have brought an increasing realization that migraine is but a symptom which may arise as a result of the presence of any of several activating factors. Although I believe that allergy is responsible for the majority of cases, either as a predisposing or activating factor, I do not insist that allergy is responsible for all migraine. Indeed, in those cases in which there is a regular periodicity, especially a periodicity with the catamenia, it seems probable that the fundamental underlying factor is more likely associated with endocrine disturbance. Furthermore, there may be an associated endocrine factor in cases manifesting, at the same time, an allergic factor. Englebach[2] found that among 370 cases with thyroid dysfunction 137 complained of headache. Among these 137 the headache was typically migrainous in character in 26. Among 257 headaches associated with pituitarism 46 were migrainous. Among 75 with thyropituitary dysfunction and associated headache, 21 were typically migrainous. Among 222 gonadal cases with headache, 57 presented the symptomatology of migraine. He observed that headache accompanied the catamenia predominantly in the gonadal and pituitary types of endocrine dyscrasia.

It is of special interest that allergic therapy in migraine has been more unsuccessful in those cases in which the headaches accompany the catamenia than in other types. The presence of an associated endocrine factor or a primary endocrine factor in these cases must be considered and should be taken into consideration in therapy.

So far as the writer has been able to determine, Rohrer (1915) was the first to suggest that migraine might be allergic. Thirteen years after Richet had presented his report, opening up an entirely new field of medicine, Rohrer suggested that the symptoms of migraine were similar in certain respects to those of anaphylactic shock. He stressed the fact that anaphylaxis was inherited only through the mother and that there is a high incidence of maternal inheritance in migraine. Pagniez and his associates (1919) again suggested the possibility of an allergic etiology in migraine and followed this by the report of a series of cases treated with peptone as a so-called non-specific desensitizer. Joseph L. Miller was the first in this country to attempt peptone treatment of migraine, reporting benefit therefrom. Vaughan[3] first demonstrated conclusively an allergic etiology (1927), by (a) the finding of positive skin reactions; (b) relief of symptoms following avoidance of foods reacting positively, and (c) subsequent induction of symptoms by the feeding of those foods which had reacted positively.

The Author's Allergic Studies of Migraine

Although in the author's first series he found evidence of an allergic factor in most of the cases, he was able to relieve only about 36 per cent by allergic dietary avoidances. In his second series[4] reported five years later, he found evidence of an allergic factor in approximately 70 per cent and was able to give adequate relief with allergic treatment only in about 50 per cent. It becomes obvious that efforts should be made to give relief to 70 per cent of patients with migraine, using allergic measures. Whether this can ultimately be accomplished remains to be seen, since, in those cases with allergic personal or family history who were not relieved (20 per cent), non-allergic activating factors played a prominent role. These factors included such as fatigue, constipation, emotional excitement, infection and the like. They in all probability must be adequately controlled to raise the percentage of successful relief from 50 to 70. Many of those with an allergic factor, who did not experience adequate relief, showed a regular periodicity of attacks, usually associated with the catamenia. This suggests that associated endocrine therapy might be profitable and we have since found this to be true in a number of instances.

But, aside from control of non-specific activating factors, the writer has felt that the results of skin testing in the diagnosis of food allergy leaves much to be desired and that there was distinct room for improvement in the methods of allergic diagnosis.

Thus, it was found that the skin test gave reliable information in only approximately 50 per cent of instances. Many of the foods responsible for attacks of migraine gave only borderline reactions. Therefore, it became necessary to include borderline reactors as possible etiologic factors. As a consequence a number of foods were included which did not actually cause trouble. However, it was found that the simplest method for the discovery of the causative foods consisted in the prohibition of all positive and borderline reactors. After the patient had been adequately relieved, one after another of these foods was added to the diet. In this way those responsible for symptoms were gradually separated from those not responsible. It was found that on an average one could take with impunity about half of those foods which had given positive or borderline reactions. This half was not limited to the positive reactors as contrasted with borderline. Indeed ,some of the strongest reactors could sometimes be taken without symptoms while borderline reactors would cause symptoms.

Just as the skin test to foods gives a number of false positive reactions, it also gives false negative reactions. That is, a food which actually causes trouble may fail entirely to react, with the particular skin test material used. This is much truer with food allergens than with other allergens such as the inhalants, in which there is a reasonably high percentage of accuracy to the skin reactions.

It, therefore, becomes necessary to develop some means by which false negatively reacting foods may be discovered. The writer has found three adjunct procedures most helpful in this regard. The first is the keeping of the food diary. The patient, placed on dietary restrictions based upon the positive skin reactions, keeps a diary of each food and all other substances taken by mouth at each meal and between meals, for a period of weeks or months if necessary. During this period the patient records each attack of migraine or any other allergic symptom as it develops. After a number of such episodes have occurred, careful study of the diary will sometimes show that certain foods have been eaten only within the twenty-four hours preceding the onset of an attack. These foods are then held under suspicion and are tested by the leukopenic index method to be described shortly. A food diary is only an approximate method. Very rarely indeed does a food stand out clearly, as causative, by this method. This is due in part to the fact that one may at times eat a food to which one is allergic without developing symptoms, while at other times symptoms ensue. As a consequence the diary will show that foods that actually cause trouble do not necessarily appear on the diary only before attacks. They may appear at other times but when they preponderate just prior to attacks they are held under suspicion.

Even though information acquired from the food diary is not final, it has a distinct value, as indicated by the fact that for every 150 actual causative foods found by the skin test method in a series of individuals with migraine, the author found 60 additional causative foods by the method of the food diary.

The next procedure that has been found helpful is based upon the author's genetic classification of foods. We have found that there is sometimes an allergic relationship between foods belonging in the same biologic groups. For example, one group consists of parsley, celery, parsnip and carrots. A patient with migraine and colitis was tested with the various foods and gave positive skin reaction to carrots. On the avoidance of carrots the colonic symptoms were relieved. Since parsley, celery and parsnip are closely related to carrot, the patient was directed to carefully observe the effect of eating these three foods. Following this study he discovered that celery was responsible for the attacks of headache. This had been a false-negatively reacting food which was ultimately recognized as the causative agent on the basis of an understanding of genetic relationships.[5]

Some of the commoner food groups are as follows:

The mustard group: Mustard, radish, turnip, cabbage, cauliflower, brussels sprouts, broccoli, kale, kohl-rabi.

The peach group: Peach, apricot, cherry, almond, plum, prune.

The legume group: Peas and beans (all varieties), peanuts.

The potato group: Irish potato, tomato, egg plant, red pepper, green pepper.

The celery group: Celery, carrot, parsley, parsnip.

The melon group: Melon, cucumber, pickle, pumpkin, squash.

The lily group: Asparagus, onion, garlic.

The rose group: Strawberry, blackberry, raspberry.

The third method which we have recently developed and which in our experience adds much to diagnostic accuracy is the leukopenic index.[6]

The normal leukocyte response to the ingestion of food is either in the direction of a post-digestive leukocytosis, or no noteworthy change in white count. We have found that in the presence of specific sensitization to a particular food, its ingestion is followed by a temporary drop in the white count, usually of more than 1,000 cells per cubic millimeter. Usually this drop appears within the first ninety minutes after food ingestion although it may occur later. The leukopenic index test is therefore applied by the taking of two fasting white counts, after which the patient eats the food to be tested. Additional white counts are then made at the end of thirty, sixty and ninety minutes. If any of these three counts falls more than 1,000 below the mean of the fasting counts, the index may be considered positive and the patient allergic to that food. A leukopenic drop of less than 1,000 may be of no significance or may be borderline. We have seen drops of less than 1,000 with foods to which the person is known to be allergic.

In a carefully controlled series with known sensitization to specific foods, tested both by the skin test method and the leukopenic index, we found a reliability of 64 per cent for the skin test as contrasted with 81 per cent for the leukopenic index.[7]

The problem cases are those in which the index is borderline, ranging down toward a 1,000 drop but not definitely positive. The corresponding skin reactions may be positive, negative or borderline. One would wish especially to know whether such a borderline leukopenic is of diagnostic significance. Theodore E. Squier[8] has contributed what I consider to be a very important addition to the leukopenic index test, especially so in that it gives us the desired information with regard to the borderline cases. With every total white cell count he does a total eosinophil count. With known sensitive individuals he finds that as the total white count falls, the total eosinophil count rises. If, therefore, there is a fall of less than 1,000, a borderline fall, but at the same time the eosinophil count rises, the index is considered positive. If both the total white count and the eosinophil count fall, together, the index is negative even though the drop be below 1,000.

Discussion

It will be seen from the preceding discussion of food allergy as applied to the study of migraine that there are many factors that must be taken into consideration beyond the simple application of the skin test. This is equally true of the study of other manifestations of food allergy, in which these same diagnostic measures are applied. The writer believes that some of the failures of certain investigators to achieve satisfactory relief in the treatment of migraine as an allergic phenomenon has been due to the failure to realize that there is much more to the allergic study than merely the application of skin testing. For best results not only must the diagnostic study be complete and exhaustive but in addition the patient must be followed very closely for many months, before all of the predisposing and inciting factors have been recognized, and controlled as adequately as possible.

Periodic headache, due to the ingestion of specific foods, is a relatively common phenomenon and therefore worthy of careful study. This is indicated by the observation of Vaughan[9] who found in a survey of an entire community of 508 individuals, that seven per cent of the population had suffered at one time or another from headaches clearly attributable to specific foods. This is confirmed in the report of Alvarez and Hinshaw[10] who found that among 400 persons with primary gastro-intestinal complaint, there were 59 instances in which the patient knew that certain foods caused headache. This does not mean that 59 of the 400 patients had this type of headache. The total number of such patients was not stated. Some undoubtedly incriminated two or more foods and the total number of such incriminations in the entire series was 59.

Goltman[11] has maintained that true migraine may follow the inhalation of substances to which one is sensitive. This is to be distinguished from the sinus type of headache that occasionally accompanies a local allergic reaction in the nose. We have recently been able to confirm this in a case of dust sensitiveness. The allergen after inhalation appears to be distributed in a similar manner to the alimentary allergen after absorption. Therefore, the patient with migraine should be tested for both inhalant and ingestant sensitiveness. If found sensitive to inhalant allergens these should be avoided if possible or hyposensitization should be carried out.

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Interpretation of the Skin Test Used in Allergic Disorders[*]

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VARIOUS types of skin tests are used to detect allergy. Examples of these are the tuberculin test, and the so-called patch test for suspected sensitiveness to poison ivy and other causes of contact dermatitis. Since, however, this symposium has to do largely with the asthma, hay-fever, or atopic group, and also because of a separate contribution on dermatologic aspects in which patch tests will doubtless be included, the skin reactions herein described will refer solely to those represented by an immediate urticarial wheal.

Historically, it is of some significance that when allergy was announced as a medical discovery some 20 years ago, its immediate popularity was due in large part to the new laboratory procedure—the skin test. This promised to reveal the particular protein to which an individual was sensitive, and treatment thereafter either by avoidance of this harmful substance or by inoculation with it promised to become relatively simple. The theory of positive skin reactions was that the body was sensitive in all its tissues, and if one rubbed a solution of the suspected protein causing asthma, for instance, into the abraded skin, a positive reaction would have the same significance as if it were applied to the bronchi. Although the fallacy of such reasoning has been demonstrated again and again, it seems surprising that the skin test still is used and interpreted from that point of view by many able clinicians.

For some time it has been realized that although it is conceivable that all the tissuses of the body of an individual with allergy may be sensitive, certainly there is an enormous difference in degree of sensitiveness among the various organs. For instance, a child may develop asthma after eating egg. Egg, or its digestive derivative, can reach the bronchi only via the systemic blood stream which circulates through the skin, brain, heart, thyroid, muscle, bone, etc., but none of these give the slightest indication of disturbance. Only the bronchi are clinically sensitive in this instance. In another child sensitive to egg, with eczema alone, only the skin is sensitive. To be sure, if in such a child a large amount of egg white were injected intravenously, vomiting, hives, and other disturbances would probably occur and thus indicate that several organs really are sensitive if stimulated sufficiently. From the practical standpoint, however, it is of much importance to realize that in man sensitization occurs within him only here and there at a given time, and not all over. The tissues affected most are those of the skin (eczema, hives), the respiratory tract (asthma, hay-fever), the gastro-intestinal tract and possibly the meninges. These have been spoken of as "shock organs" as they are the most easily affected. It appears that these few shock organs are rarely shocked at the same time, since one does not usually have eczema and asthma and vomiting all simultaneously.

These observations have a direct bearing on the skin test. The reason a positive reaction occurs is supposedly because there is a reacting substance, some "antibody," in the skin cells. When the protein or antigen is placed in the skin it comes in contact with its specific antibody and a reaction occurs. It is believed that a chemical substance akin to histamine is released on such contact. If histamine is injected into normal skin, it gives a wheal apparently identical to that which occurs as a positive skin test when a specific protein is injected into an allergic skin. As a matter of fact, if the dose of histamine injected into the skin of a patient with hay-fever be adjusted and at the same time pollen extract be injected, the resulting wheals appear almost identical (Figure 1). There is some doubt whether their composition or mechanism of production are really identical, but for the purpose of this discussion they are. Histamine also causes smooth muscle spasm and swelling of mucous membranes, which occur with hay-fever, asthma and gastro-intestinal allergy.

It is a statistical fact that all people with allergy do not give positive skin reactions. A tabulation[1] made a few years ago shows the following:

FIGURE 1

Fig. 1.—T = 0.02 c.c. of 1-10,000 timothy extract; H = 0.02 c.c. of 1-2,000 histamine acid phosphate. Figures give area of wheals measured in square centimeters fifteen minutes after injection.

TABLE I

POSITIVE SKIN REACTIONS IN 11,443 CASES OF ALLERGY

Allergic Manifestations	No. Observers	No. Cases	No. Positive Reactions	% Positive Reactions
Hay Fever	9	4,381	4,076	93.2
Vasomotor Rhinitis	8	1,020	568	55.7
Eczema (infant and adult)	10	775	408	52.7
Bronchial Asthma	13	4,809	2,536	52.7
Gastro-intestinal Allergy..	4	460	122	26.5

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Why skin tests are more certain in hay-fever than in vasomotor rhinitis, for instance, which is an identical lesion, is not known. How, then, does one account for the negative skin reactions, in the presence of known allergy? Obviously, the skin is not sensitive. In other words, it contains no antibodies, and no matter how often the test be repeated, or how much allergen applied, if no antibody is present, no reaction can possibly occur. Hence, the original thought that all the cells of the body are equally sensitive, proves wrong. Only a few tissues are clinically sensitive. In any given case, if the skin should be sensitive, a positive skin reaction is possible. If the skin is not sensitive together with the nasal or bronchial mucous membranes, a reaction is impossible. The ophthalmic test[2] wherein pollen is applied to the conjunctiva sometimes gives a positive reaction when pollen applied to the skin does not. Likewise, allergens applied to the nasal mucous membranes[3] in sensitive individuals may cause these tissues to swell; whereas when applied to the skin, no reaction occurs. In these cases, antibodies reside in the conjunctival and nasal mucosae, but none in the skin. So ,again, if antibodies are absent, there can be no positive reaction. This, then, would account for the absence of skin tests in the presence of known allergy. The factors that control the production of antibodies in the skin or elsewhere are not well understood.

Not only do comparatively few organs manifest allergy, but none of these appear to be uniformly sensitive at a given time. At least, physical signs reveal an uneven distribution of lesions. In urticaria, for instance, wheals appear only here and there on the skin and not everywhere. There is considerable evidence that in asthma only some of the bronchi participate in a given attack, whereas others are comparatively free. Roentgen-ray studies reveal[4] that during spasm of the bowel from the ingestion of a particular foodstuff, only certain segments are involved. This uneven distribution of sensitiveness is reflected in the skin reaction. If equal quantities of the same allergen are injected into different areas at approximately the same time, the response will be different.

FIGURE 2

Fig. 2—Ragweed pollen extract, 0.02 c.c. of a 1-10,000 dilution, injected into various sites of the skin of a hay fever patient. Figures give area of wheals measured in square centimeters fifteen minutes after injection.

This fact has considerable bearing on interpretation of skin reactions, and makes quantitation of them doubtful. For instance, if a patient gives a four plus reaction on the back to orris root extract, and a one plus reaction to it on the leg, it is difficult in terms of pluses to state just how sensitive he may be. So much depends on where the test is applied. As a general rule, the skin of the trunk is consistently more sensitive than elsewhere. If a skin test is negative on the back it is apt to be negative elsewhere.

Such variability may be temporal also. Tests done at the same site on two occasions may vary considerably in their reaction if a substantial interval of time—a few months, perhaps—be allowed to elapse. This variability holds more true for weaker reactions. Pollen tests, for instance, which invoke a strong skin response, usually remain markedly positive on consecutive tests.

Perhaps the most disappointing vagary of skin testing is the appearance of positive reactions to allergens which apparently have nothing to do with the symptoms complained of. These are the so-called "false positives." Such reactions are common, and in a series of apparently normal individuals with neither detectable allergy nor allergic background recently reported,[5] an appreciable number gave positive reactions when allergens were applied to the skin. Whether or not such reactions were due to non-specific irritants in the extracts used, the fact that positive reactions may occur under such circumstances complicates the test.

A knowledge of these factors which so profoundly influence skin reactions is essential to a proper evaluation of them. Moreover, account must be taken of other factors which have to do with the technique of testing, with the preparation of the allergens employed, and with the possible deterioration of extracts.

In view of these many limitations, the question arises whether skin testing has sufficient merit to justify the time and expense of its performance. No valid answer is possible at present because there is no uniform interpretation of reactions. For instance, a doubtful or one plus skin response (a common finding) is considered by some as having much significance. Such reactions are regarded as representing a potential source of trouble and the patient is protected against them, no matter how many there may be. On the other hand, there are those who, realizing the shortcomings of skin testing ,pay far less attention to it and look with suspicion upon positive and negative reactions alike. Some allergists are constantly adding new testing materials—bacteria, pollens, vegetable powders—lest some possible allergen to which a patient might conceivably be exposed be omitted from their armamentarium. Others are shortening their lists. No statistical clinical data is available concerning the advantage of one procedure over another, and those using each express satisfaction and claim good results.

There are, however, certain facts concerning skin reactions which admittedly give value to the test. In determining pollen sensitivity it is quite dependable. When done by the process of passive transfer, a positive reaction has significance. Here blood serum (0.1 c.c.) from the patient is injected into the skin of a normal individual. Twenty-four to forty-eight hours later the allergen in question is introduced at the site of serum injection into the normal skin. Immediate wheal formation representing a positive reaction indicates that the patient carried specific immune bodies in his blood against the offending allergen, which then assumes much significance. Without the rather elaborate procedure of passive transfer, it is justifiable to look upon three plus or four plus skin reactions (with negative controls) with more suspicion that the allergen causing them may be responsible for the symptoms complained of. Large reactions as these are much less frequent than smaller ones designated as doubtful or one plus. In patients sensitive to pollens, orris root and other allergens, in whom treatment with extracts is indicated, it is customary to determine the initial dilution to be used by injecting several strengths into the skin and observing the weakest one that gives a reaction. This procedure has been an important function of the skin test.

It is useful to know the incidence of positive reactions to the various allergens used. A compilation of these was made a few years ago from several reported series (Tables 2A and 2B). The newer allergens, as house dust, were not included.

It will be seen that allergens giving the greatest number of positive responses are those to which, by and large, contact is most frequent. In some clinics these are the ones which together with local pollens are used routinely rather than a more extended list, and special tests are done only when indicated.

TABLE 2A
INCIDENCE OF REACTIONS WITH COMMON ALLERGENS (32182 TESTS)

Allergen	No. Tests Done	No. Positive Reactions	% Positive Reactions
Feathers * Ch. G. D.	5,491	1,130	20.3
Orris Root	2,537	429	16.9
Horse Dander	2,798	463	16.6
Wool	602	68	11.3
Pyrethrum	1,153	108	9.3
Cat Dander	1,667	154	9.2
Cattle Dander	745	65	8.7
Dog Dander	365	19	8.3

All others less than 5%.
*Ch. = chicken; G. = goose; D. = duck.

TABLE 2B

Allergen	No. Tests Done	No. Positive Reactions	% Positive Reactions
Wheat	1,999	447	22.4
Egg	923	170	18.4
Milk	1,176	171	14.8
Chocolate	285	40	13.9
*Spinach	330	44	13.3
Bean	822	126	12.9
Potato	604	73	12.1
*Tomato	522	62	11.9
*Carrot	329	39	11.8
*Pea	548	63	11.5
*Barley	644	69	10.7
Rye	946	84	8.9
Pork	508	42	8.3
Beef	527	42	7.7
*Oat	1,711	115	6.7
Corn	1,774	117	5.7
*Rice	635	36	5.7
Pepper	452	79	17.5

All others less than 5%.
*Figures taken mainly from cases of infantile eczema.

Discussion

From the above presentation it appears that skin testing offers many difficulties in the diagnosis of those allergic disorders in which the immediate reaction or wheal formation is involved. The disadvantages of the test have been emphasized because physicians who are not allergists, as well as the interested laity, are often persuaded that a set of allergens or a series of skin tests will solve the cause of allergic symptoms.

One hears two points of view: There are those, mostly allergists, who are enthusiastic about the value of skin testing; and those, the practitioners and specialists in various fields touched by allergy, who find the test of little use. It has grown unpopular with the latter. This state of affairs is understandable, for allergists who constantly perform skin tests have developed sufficient experience to make interpretations and have also learned to correlate positive reactions with exposure of the patient to the allergen involved and so observe whether or not symptoms result.

For one who without experience wishes to use the skin test, he may do the test extensively and check each positive reaction by exposing the patient to the corresponding allergen and observing the clinical response. If none occurs, and the same holds true when the reactions are checked at another time, he may begin to exclude allergens producing negative tests from the patient's environment and look for clinical improvement.

Another method is to utilize the statistical data which indicates that comparatively few allergens (Tables 2A and 2B) are responsible for most symptoms, and test with these. The list may be enlarged by including other allergens in the patient's particular environment whether at home or at work, to which he is exposed, or by adding foods frequently eaten. Then positive and negative tests may be regarded as above. If no result be obtained, a further limited series of tests may be done and treated in the same way. Eventually, experience will be acquired which in turn will lead to an individual interpretation and the test will thereby be of more and more value.

It is unfortunate that these things are so, for allergy is so common that some simple way of diagnosing the underlying cause should be in the hands of the practitioner who treats most of the cases. He has his choice of (1) using the test extensively and, in the course of years, developing his own interpretation; (2) using the test in a limited way as mentioned above, and (3) not using the test at all excepting in hay-fever, and substituting clinical exclusion methods. This involves the use of exclusion diets and the protection of the patient by placing him in an environment as free as possible from common allergens. None of these methods is simple, but they are all far more effective than acceptance of absolute significance to positive or negative skin reactions.

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Description of a Technic for the Study of Allergy in Eczematous and Eczematoid Dermatoses

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THE physician of today—regardless of his field or specialty—is obliged to keep abreast of the times. It is obviously becoming more and more difficult for any one to keep himself up-to-date in his reading of the mass of new material in specialized fields, the very existence of which was unknown only a few years ago. When one considers such special fields as endocrinology, the vitamins, and allergy, the rapid growth of the new literature is overwhelming.

In attempting to master and to apply this new knowledge in whatever field, two principal difficulties are regularly encountered. First, the difficulty of understanding new theories which are often obscured by the employment of strange and newly coined nomenclature, definitions, and classifications; and, second, the difficulty of the practical application of the new methods

We have recently discussed and attempted to clarify the nomenclature, definitions, and classifications of modern allergy.[1 2 3] In the present communication, we shall, therefore, omit all theoretical considerations; and shall confine ourselves to the presentation of a practical technic for investigating presumably allergic eczematous and eczematoid dermatoses.

The investigation of a given case may be divided into two phases: (1) the determination of the type of eczematous or eczematoid dermatosis, and (2) the discovery of the causal or sensitizing agent.

In both of these phases of investigation, the history—family as well as personal—is of paramount importance. The necessity for obtaining a complete and accurate history cannot be overemphasized. We believe that this is of greater practical help in obscure cases, than are all other investigative measures. While not in any way wishing to minimize the value of skin tests, we are convinced that the history surpasses the skin tests as an investigative method.

We are, therefore, submitting a form of questionnaire which we have found useful in our office and clinic practice:

I. *Is there a family history of:*
  A. Asthma?
  B. Hayfever or vasomotor rhinitis (seasonal occurrences)?
  C. Infantile eczema?
  D. Atopic dermatitis (neurodermatitis disseminata or infantile ecezema)?
  E. Seborrhea (baldness, acne, seborrheic dermatitis)?
  F. Hives?—angioneurotic edema?
  G. Other skin eruptions?
  H. Idiosyncracy to drugs?
  I. Other familial diseases?

II. *Have you had:*
  A. Asthma?
  B. Hayfever?
  C. Eczema (infantile)?
  D. Fungous infections? or eczematous 'ids'?
  E. Poison ivy?
  F. Seborrhea
    1. dandruff?
    2. acne?
    3. falling hair?—baldness?
  G. Hives?
  H. Other skin eruptions?
  I. Any major illness?

III. A. When did the eruption begin?
  B. Did you have this previously?
  C. Where did the eruption begin and how did it spread?
  D. Is it constant or periodic? of sudden or gradual onset?
    1. Seasonal influences?
    2. Other chronologic association with home or other contacts?
    3. Other remarks on course of malady?
  E. Do you know of anything which makes it worse?
    1. Foods?
    2. Clothing?
    3. Menses?
    4. Illnesses and remedies?
    5. Miscellaneous?
  F. What have you done for it—internal and external medicaments and treatments?
  G. Medication in general (proprietary or prescribed)
    1. for headaches?
    2. for constipation?
    3. for "acid in system" ("blood purifiers," tonics)?
    4. for sleeplessness?
    5. for "nervousness"?
    6. for coughs?
    7. for menstrual periods?
    8. Bromo Selzer?
    9. Bromo Quinine?
    10. Iodized salt?
    11. other medication—internal or external, proprietary or prescribed?
  H. Cosmetics
    1. Used by you (scalp tonics, wave-sets, powder, lip-stick, rouge, beauty creams, freckle creams, wrinkle removers, perfumes, soaps, bath salts, astringent lotions, depilatories, deodorants, massages, etc.)?
    2. Used by others in home?
    3. Applied at beauty parlor or elsewhere?
  I. Occupational and avocational contacts
    1. At work
      a. principal substances handled?
      b. incidental substances handled—e. g. cleaners?
      c. physical conditions of the contacts?
    2. At home
      a. cleansers, insecticides (professional exterminators)?
      b. pets, plants, substances used in their care?
      c. furniture, drapes, clothing (new — cleaned—dyed)?
      d. hobbies — photography, stamps, golf, cards, other games?
      e. miscellaneous?

Tests Indicated. . . .

This questionnaire is by no means complete, and is intended to serve merely as an outline for the interrogation of patients in general. There will be many instances in which some of the questions need not be asked. For example, in clear-cut cases of fixed drug eruptions, or in clinically obvious contact dermatitides, many of the questions will be superfluous. On the other hand, in obscure cases, certain aspects of the questioning will have to be stressed and additional questions of more specific nature will have to be added.

The results of the questionnaire are then evaluated as follows:

1. A positive family and personal history of atopic conditions (hayfever, asthma, infantile eczema) speaks in favor of an atopic dermatitis (disseminated neurodermatitis).

2. A positive family and personal history of seborrheic conditions speaks somewhat in favor of seborrheic dermatitis.

3. A positive personal history of eczematous fungous eruptions (dermatophytids), or of poison ivy or other contact dermatitis, speaks somewhat in favor of contact dermatitis.

These findings help to classify the case and point the way to further investigation.

The next evidence to be weighed is that presented by the appearance, distribution, and localization of the dermatosis:

1. The first appearance of the eruption on exposed surfaces, the presence of acute manifestations (such as marked erythema, edema, and especially vesicles), the lack of marked predilection for the flexures or for seborrheic areas—all speak in favor of contact dermatitis.

2. The more chronic appearance of the dermatosis, with papules and lichenification, and with lack of acute erythema and of vesicles; the brownish or grayish pigmentation; the predominant localization in the flexures (antecubital, popliteal), sides of the neck, around the eyes, and dorsa of the wrists; the severe itching, the chronic course, and the presence of eosinophils in the blood smear all speak in favor of an atopic dermatitis.

3. The absence of all the foregoing criteria, together with the presence of greasy, yellowish scales, the concomitant appearance of dandruff, and the favoring of the so-called seborrheic areas (scalp, behind the ears, in the ears, the eyebrows, on the sides of the nose, over the sternum, in the axillae, in the umbilicus, and on the mid-portion of the back)—all speak in favor of seborrheic dermatitis.

When the foregoing information has been assembled, the indicated skin tests are to be performed. We routinely employ both the scratch and the patch methods of skin testing. (For detailed information as to the technic of skin testing, see Refs. 4, 5.)

At present our routine patch tests consist of the application of the following 20 substances selected from a long list of common eczematogenous allergens:

Routine Patch Test Substances for Routine Examination

1. Copper sulfate, 1% aqueous solution.
2. Turpentine, 50% in olive oil.
3. Sodium arsenate, 10% aqueous solution.
4. Neo arsphenamine, 1-500 aqueous solution.
5. Milled pyrethrum, as commercially obtainable.
6. Butesin picrate, 5% as commercially obtainable.
7. Quinine hydrochloride, 1% aqueous.
8. Resorcin, 1% alcoholic solution.
9. paraphenylendiamine, 2% in white vaseline.
10. Tuberculin, 1:1,000 in physiologic saline.
11. Trichophytin, 1:1,000 in physiologic saline.
12. Potassium iodide 50% in aquaphor.
13. Formalin, 5% aqueous solution.
14. Nickel sulfate, 5% aqueous solution.
15. Bichloride of mercury, 1:1,000 aqueous solution.
16. Histamine, 1:1,000 aqueous solution.
17. Turkey red oil, as commercially obtainable.
18. Linseed oil, as commercially obtainable.
19. Ammonium fluoride, 1% aqueous solution.
20. Benzocaine, 5% in aquaphor.

Our routine scratch tests are performed with purchasable dry, powdered allergens applied to the skin with the same technic as that employed in the investigation of asthma and hayfever. The following 103 allergens form our standard series:

Protein Extracts for Routine Scratch Tests

A. FOODS (70)

almond
apple
asparagus
banana
barley
bean
beef
beet
bluefish
cabbage
carrot
casein
cauliflower
celery
American cheese
chestnut
chicken
clam
cocoa
codfish
coffee
corn
crab
duck
egg white
egg yolk
garlic
grape
grapefruit
halibut
herring
lamb
lemon
lettuce
lima bean
lobster
mackerel
milk
mustard
oat
onion
orange
oyster
paprika
pea
peach
peanut
pear
pecan
pepper—black
pepper—red and green
pineapple
pork
potato—white
potato—sweet
prune
rhubarb
rice
rye
salmon
sole
spinach
strawberry
tea
tomato
tuna fish
turkey
veal
wheat
white fish

B. INHALANTS (17)

camel hair
cat hair
cattle hair
chicken feathers
duck feathers
goose feathers
dog hair
goat hair
horse dander
rabbit hair
sheep wool
silk
cotton
kapok
orris root
tobacco
dust

C. PLANTS AND POLLENS (16)

redtop
timothy
orchard grass
blue grass
ragweed—short
ragweed—giant
dahlia
corn
rose
dandelion
goldenrod
rye
sumac
marsh elder
plantain
cocklebur

The results of these routine tests offer additional evidence for the classification of the case under consideration. When there are one or more *positive patch tests* and *no wheal reactions to scratch* tests, this speaks in favor of the contact type of skin hypersensitivity. When there are *negative patch* tests and one or more distinctly *positive wheal reactions to scratch* tests, this speaks in favor of atopic dermatitis (disseminated neurodermatitis). When there are numerous positive reactions to both methods of testing, this points to the possible combination of atopic and contact dermatitis. When neither method of testing elicits any reaction, this would tend to exclude both contact and atopic dermatitis, and favor the diagnosis of seborrheic dermatitis, of drug eruption, or of some other form of allergy not regularly associated with positive skin tests; or of some non-allergic dermatosis.

In most cases, the above investigative measures will suffice; but it cannot be denied that even the most experienced dermatologist will, not infrequently, encounter conditions which defy classification. Such unclassifiable cases must be exhaustively investigated in every possible direction, including the continued search for specific causal substances. Both contact allergens and atopic excitants, as well as bacteria, fungi, drugs, and other agents must, of course, be considered in the search for the responsible factor in these unclassifiable cases. Furthermore, systemic disorders such as diabetes, blood dyscrasias, neoplasms, liver and kidney diseases must be rigorously excluded.

Thus far we have discussed only the investigation necessary to attempt the classification of eczematous and eczematoid eruptions presumably of allergic nature.

In some instances, the etiologic agent is discovered during this preliminary investigation. When this is not the case and when only classification has been accomplished, the next step will obviously be the etiologic diagnosis, i. e., the more intensive and specialized search for the causal factor or factors in the specific case.

(1) Seborrheic Dermatitis

When the above preliminary investigative steps point to this diagnosis, it is usually futile to search for causal allergens. For, as is well known, seborrheic dermatitis is not based upon a specific hypersensitivity to any known excitants.

(2) Atopic Dermatitis

When this is the presumptive diagnosis, the allergens to be considered are of protein nature and essentially the same as those operative in hayfever and asthma. Both foods and environmental allergens may be responsible. It is necessary to perform elimination diets and to eliminate the most common inhalant offenders as far as possible. (The most common offenders among the foods are: wheat, eggs, milk, fish. Among the inhalants the most common offenders are: house dust, silk, feathers, wool, pollens.)

We must call attention to the fact that negative skin tests to these atopens by no means prove that they are innocuous in the given case. Elimination of at least several weeks' duration and renewed exposure to the suspected atopen is here *the* essential procedure. Unfortunately, we have found the results of skin tests to be of very little value in treating atopic dermatitis; perhaps because of the impossibility of complete elimination of the many common foods and inhalants to which skin test reactions are regularly encountered in this group.

(3) Contact Type of Eczematous Sensitivity

When the preliminary findings point to this diagnosis, a most thorough and painstaking search for contact eczematogenous allergens is indicated. This will often prove time-consuming and arduous for both physician and patient; but in this particular group the results obtained from the search for specific causes are most gratifying. The number of satisfactory results is, however, in direct proportion to the patience and detective skill of the physician, and to his ability to convince the patient of the necessity for suspecting even the apparently most innocuous substances.

The suspected allergens in this group (articles of clothing, such as pieces of dyed fur, shoe-leather, hatbands, socks; cosmetics; topical remedies; shoe polishes; exterminators; parts of plants and flowers) should be applied directly as patch tests. It is unnecessary to make extracts of such substances.

In studying our contact dermatitis patients, we follow closely a method which has been described previously (Ref. 6). For the sake of completeness, we here include that description:

"A. The localization of the first appearance, or the site of predilection of the eruption directs attention to certain substances.

"In general, the face and scalp are first affected from hair dyes, cosmetics, etc.; neck and face are first affected from furs, fur dyes, collars, scarves, necklaces, etc.; hands and forearms are first affected from occupational substances, gloves, soaps, cleansers, etc.; the torso is first affected from rayon, silk, wool, clothing in general, rubber girdles, substances used in massaging, bath salts, etc.; feet and legs are first affected from shoe leather, shoe polishes, sock finishers, sock dyes, etc.; ring fingers, wrist, garter-buckle areas, and lobes of the ears are first affected from metal, bakelite, celluloid, etc.; spectacle areas, from metal or artificial tortoise shell; and so on, for a list infinitely long.

"B. The occupation of the patient directs attention to certain substances.

"For this investigation it is necessary to know or to become acquainted with the multitudinous eczematogenous substances which represent the different hazards in different occupations. It would be impossible to submit here a list of the various trades and professions and of the eczema-producing substances peculiar to each. Reference must be made to textbooks. Common industrial causes of contact eczema are the following: dyes, bleaches, soaps, detergents, lacquers, paints and finishes, turpentine, plants, woods, glue, rubber and vulcanizers, cement, flour, spices, yeasts, metals and metal polishes, quinine, formalin, and other chemicals, celluloid and bakelite, and all the innumerable substances connected with the manufacture and finishing of synthetic and natural products.

"C. The patient's hobbies direct attention to certain substances.

"Here again, space permits the mention of only a few examples: in the case of horsemen—leather and leather polishes, materials used in cleansing and disinfecting stables, etc.; in the golfer—plants and grasses, the leather and wood of golf clubs, the golf gloves, club polishes, taped handles, etc.; in the hunter—plants and grasses, gun oil and gun polishes, etc.; in the amateur photographer—the chemicals used; in the mah jong player—the lacquered tiles; in the violinist—rosin, chin rest, wood, or wood finish. In the case of patients having pet animals, not only the animal's hair, but also the substances employed in their care and cleanliness, must be considered.

"D. The investigation of practically ubiquitous causes.

"Once again, the list is incalculably long. In practically all women, the ingredients of cosmetics such as orris root, perfumes, soaps, mascara, coloring materials, hair and lash dyes, face creams, massage creams, wave-set and other lotions, are suspect; and in practically all men, shaving materials, soaps, hair lotions, brilliantine, etc.; and in all children, all toys. In persons of all ages, shoes, socks or stockings, their dyes and finishes, hatbands, wristwatch straps, garters, nickel (coins, etc.) must be considered. In practically all homes, soaps, insecticides, disinfectants, floor and furniture polishes, anti-moth preparations, plants, phenol and formalin derivatives, bakelite, rubber and its accelerators, etc., are suspect. Contact with printer's ink and rotogravure colors is almost universal. (It is here necessary to consider not only the substances used by the patient, but also those used by others in the patient's environment—see F in this group.)

"E. Furthermore . . . (and this must constantly be borne in mind), all remedies used in previous treatment are suspect and must be applied as patch tests. Moreover, although rarely, certain eruptions of true eczematous (contact type) dermatitis can be caused by ingestion and the hematogenous distribution of the causative agent. The best examples of this are the eczematous eruptions due to quinine, urotropin (formaldehyde), etc.

"F. Substances used by persons in the patient's environment.

"In the search for possible causative agents, the dyes, topical remedies, cosmetics, etc., used by others in the patient's environment must be considered. We have seen, for example, a case of contact dermatitis in a husband caused by an antipruritic lotion used by the wife; and two instances in which a mother had contact dermatitis from washing the clothes of a child who had been using a proprietary antipruritic ointment.

"G. Fungi of various genera can cause epidermal hypersensitivity and eruptions of contact-dermatitis type (eczematous and dyshidrotic 'ids'). It is quite possible that other micro-organisms can cause similar dermatoses. (*Br. Bloch's* 'microbids,' and 'bacterids' of *Darier.*) Unfortunately, a detailed discussion of these eruptions would prove too lengthy for this brief outline. Such etiologies, however, must be considered either as the direct cause of the dermatitis under investigation, or as contributory factors by causing an original eczematous sensitization to fungus products with ensuing polyvalence to include contact substances, or as complicating factors of a contact dermatitis originally caused by non-living agents. Sensitizations of the epidermis to the products of micro-organisms, i.e., eczematous 'ids,' are here not differentiated from contact dermatitis; from an immunologic standpoint, the pathogenesis seems analogous if not identical."

In this communication we have considered only the practical aspects of the classification and of the etiologic diagnosis of contact eczema and of eczematoid eruptions of atopic and seborrheic nature. However, these dermatoses, and particularly the contact group, form a large proportion of the cases in which the question of the possible role of allergic hypersensitivity and of specific allergens is to be seriously considered. Even though we have limited ourselves to this narrow field, we feel that this communication has no more than touched upon some of the salient points. But we trust that, through employing this outline as a guide, some of our readers may be aided in the development of their own technic for the study of the allergic factors in eczematous and eczematoid dermatoses.

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Trauma and the Malignant Testis*

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> "But (to say) that previous to such accident there was no cancerous disposition or malignity in the habit, is an inference that cannot be admitted."
>
> Percival Pott (1779)

TESTICULAR injuries are common among active boys of school age. At this time of life the boy's protective reflexes are in an early stage of development. While he is wrestling, climbing, falling, bicycling, playing hockey or boxing, repeated injuries occur before he learns reflexly to protect himself from injury. Such injuries tend to be less severe, however, than those received later in life, because he is smaller and lighter in weight and the testes are smaller. He does not hurl his body with such force as when his muscles become stronger. Impacts causing injuries at this age are, therefore, less violent than those occurring later and hence visual evidence of severe testicular injuries are seldom seen.

After puberty, however, testicular injuries tend to change in type and in degree. The occupations of the older boy involve efforts requiring strength; he has grown larger and heavier and the testes are larger. He works with hammers, wrenches and other heavy tools; he plays more difficult and more vigorous games and with greater abandon. So that, should he receive a testicular injury it is more likely to be a severe one. This tendency to severe injury of the testis continues into his active working life. His protective reflexes against such injuries, however, have gradually improved and trauma to the testis becomes more rare. Even so, he is still the victim of an occasional injury caused by an inadvertent fall astride a plank or a fence, perhaps while carrying a heavy burden. He may suffer an injury to the testis by a blow from a glancing hammer, or an iron wrench while his protective reflexes are off guard. Visual evidences of these serious injuries (as acute swelling for instance) therefore, are more commonly recognized beyond puberty. Into this later age period, moreover, falls the period of greatest sex activity, and it is found that in this period likewise falls the maximum incidence of testicular malignancy.

We are confornted, therefore, with a situation wherein the individual emerges from childhood, during which time he has been subject to many, though comparatively minor, injuries to the testes. He then enters the period of life wherein such injuries are less frequent but more severe in degree. In this latter period he encounters the age-zone in which testicular malignancy is most prevalent.

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With fewer but more severe injuries to the testes occurring within the period of greatest sex activity and within the period of greatest malignant prevalence, testicular trauma and testicular malignancy should be judged to hold a closer relationship and a higher coincidence than is generally conceded.

Sarcoma, as well as carcinoma, is known to invade the testis. Authors, for many years, have described cases of sarcoma associated with trauma. This phase of the subject of the malignant testis will be omitted from the present discussion, however, reserving to ourselves the consideration of carcinomatous cases only.

Why the testis should be attacked by malignancy has never been satisfactorily answered. Authors are agreed that heredity plays no part. Trauma suggests one possible answer, in that injury and disorganization or maceration of cellular tissue of a specialized type, coupled with hemorrhage and resulting irritation, in an organ difficult to immobilize during the healing period, combine to bring about delayed healing and to encourage abnormally prolonged cell proliferation.

Symptoms and clinical manifestations which occur in conjunction with and following injuries to the testes will be brought out as certain case reports which follow are narrated.

Part of the information on this subject has been gathered from opinions of pathology rendered upon biopsies in the Department of Pathology at the University of Minnesota and part from Duluth hospitals or from other hospitals or from medical literature.

That a crushing injury may occur without warning and be followed by a fatal result may be seen from the following sequence of events: A young man of 26, while piling crates of automobile batteries in a Duluth warehouse, lost his balance and was forced against the corner of a desk. The left testis was caught between the crate and the corner of the desk. He suffered great pain at once, was disabled for the rest of the day and was taken home by his brother. There was more or less swelling in this testis for three to four months when he then consulted a physician. The testis and tumor were removed but recurrence appeared in the abdomen. This in turn was operated upon and a large inoperable intra-abdominal teratoma found. He died with general malignant invasion 17 months after his original injury.

A teamster, aged 39, entered a Duluth hospital with the history of having been hit in the groin two and one-half months preceding admission. He had suffered pain in that region ever since. Swelling of the right testis began about the same time. On admission, the right testis measured 5 inches long and 3½ inches in diameter. The left testis was absent, having been removed when he was six years old (cause not stated). The Wassermann was negative. The testis on palpation was not very tender. He had been working up to the day before admission when he had quit work on account of pain. At operation the enlarged testis was removed and the pathologic report was carcinoma.

A Duluth millwright, aged 65, entered the hospital in 1925, stating he had been well up to a few weeks preceding admission. He fell astride a plank and very soon thereafter began to notice swelling in the right testis. This swelling had been progressing rapidly. He had lost weight to the extent of 40 pounds. X-ray of his chest taken, because of his cough, was negative; also x-rays of both kidneys and of the spine, were negative. The right testis was hard, nodular and approximately three times the size of the left. The involved organ was removed and on pathologic examination showed a rapidly growing carcinoma. He was discharged from the hospital "unimproved" and definitely failing. Unfortunately no autopsy or other information is available concerning him. Undoubtedly his condition went on to an early demise.

A considerable interval of time—reckoned in months, usually—which frequently elapses between the date of injury and the appearance of tumefaction, is not uncommon. Added to this interval is another period of months during which time patients are reluctant to disclose such symptoms as they may have noticed. Dean figured out that 30 per cent of the patients waited more than three months before complaining and Bowen found that his patients had had symptoms for an average of 18 months before help was sought. In Rea's group 55 per cent applied within a year.

Patients frequently object to orchiectomy and physicians naturally hesitate to insist on this procedure sometimes resorting to a biopsy report before proceeding to radical orchiectomy. The infrequent occurrence of testicular tumors no doubt adds somewhat to the physician's dilemma.

There are available from biopsy and from operative specimen reports for practitioners and for hospitals in this territory the following histories of malignant testes, although follow-ups are not given in all.

A man of 35 to 40 years of age dated his pain and swelling in one testis to an injury several months before admission. The testis on removal showed malignancy.

A man, aged 28, after an accident two months before, noticed swelling in the left testis. Biopsy showed a mixed tumor or teratoma.

A man, aged 30, was struck by a wrench two years before. Six months following the injury the left testis began to enlarge but without pain. On removal of the testis malignancy was demonstrated and the patient died five months later with metastases to the lungs.

A man of 28 hurt himself seven months before while moving a boat. At the time of injury an examination showed both testes apparently normal. About four or five months later he noticed a lump in one testis. At the end of seven months this testis was the size of a fist. At operation it proved to be a mixed tumor or teratoma.

Two cases with briefed histories both of which came to necropsy are given as follows:

A man, aged 36, received an injury to the pelvis around the scrotum several years before admission, after which injury the testis receded into the abdomen. No symptoms attracted his attention until a few months before admission when he noticed enlargement in the lower abdomen. On exploration, the enlargement was found to be a malignant tumor. At autopsy the testis was entirely replaced by the tumor.

A man, aged 40, was hit in the left groin, 13 months before admission when he came into contact with the corner of a table. This caused him great pain. Almost immediately he noticed swelling of the left testis and pain in the left groin. Removal of the testis was done and the growth showed a malignant mixed tumor. He was admitted on subsequent occasions and treated for recurrence but without success. Autopsy showed the malignant process had transferred itself by metastasis to the lungs.

MacKenzie and Ratner reported two cases the second of which raises the question as to whether injury or inflammation influenced the incidence of malignancy.

A man of 23 had been struck on the right side of the scrotum 16 months before admission. During 10 of these months he had gone about with a swollen right testis. The malignant tumor was removed and he died promptly.

Their second case was that of a man, aged 40, who came with pain and swelling in the right scrotum. In the army, 10 years before, he had had "inflammation" in the right testis which lasted three weeks. There was also a history of injury with pain and swelling one month before admission. The right testis with a tumor was removed and malignancy demonstrated. The patient died in two years.

There are instances on record in which longer periods of time have elapsed between the events of injury and of treatment for malignancy. This is evident in the following case report by Wollheim:

A man, aged 54, was admitted in January, 1929. In 1898, (31 years before) during the Spanish American War, he fell astride a fence while he carried an 80 pound pack. Both testes were crushed in this act and both were swollen, but in time the swelling subsided. Two years later the right testis was removed (cause not given). When he was admitted in January, 1929, 31 years after the crushing injury, the left testis was swollen. After removal, this testis on examination showed malignancy.

In 1925, a man, aged 38, reported to Bentley for examination. This patient stated that 16 years before, he had received an injury to the right testis while playing baseball. Since that time the right testis had been larger than the left. For the last year the swelling had continued to the time of admission. The testis was removed, showed malignancy and the patient died ten months later. Autopsy disclosed malignant metastases to the lungs.

Malignancy demonstrated seven years after injury is shown in another case of Bentley's:

A man, aged 52, was admitted, who stated that seven years before he had fallen astride a board. Both testes were enormously swollen and he was bedridden for several weeks. There was some atrophy of the left testis following the injury. Three years later a small growth appeared in this same atrophied testis and six months before admission the growth had increased rapidly in size. The tumor was removed and he died 14 months later with extensive spread of the secondary growth. The specimen showed the malignancy apparently arising from the seminal tubules.

Bentley also recorded a case with a four year history:

The man, aged 38, on admission stated that four years before he had suffered an injury following which, swelling of the left testis had started. This swelling had been gradual until four months before admission, when it became marked. On examination it measured 6 inches in diameter. The tumor, on removal, showed malignancy.

As a direct opposite to these long interval histories just cited, cases occur in which a very short period of time elapses between the date of injury and the appearance of malignancy.

Vander Veer reports the following interesting case:

A man of 26 was admitted with a slight painless swelling of the left testis. His two year old baby girl had kicked him in the scrotum two weeks before while he was jouncing her on his lap. Two days later he noticed that his testis ached. There was gradual enlargement but no pain until the time of admission when it was found that the left testis was larger than the right. At the end of another week there was no improvement and the testis was removed. The removed testis was shown to be malignant but the patient was reported well at the end of a year.

Bentley mentions three cases with three, six and 12 weeks' histories, respectively, as follows:

A white male, aged 33, was admitted stating he had noticed swelling in the left testis for three weeks. There was a definite history of injury. He complained of no pain but rather a sensation of weight and aching in the back. On removal, the tumor showed malignancy apparently arising from the seminal tubules. This man returned in one month with signs of metastases and died several weeks later.

A young man of 20 was admitted, stating six weeks before he had struck the right testis with a large pair of pliers. There was some distress and swelling at the time. The testis continued to enlarge until he consulted the doctor, at which time the testis was as large as a hen's egg. A simple orchiectomy was done and X-ray therapy was given. He was reported well four years later although malignancy was reported at the time of operation.

A man of 30 was admitted with swelling of the left testis. Twelve weeks before he had struck this testis with a wrench and had been forced to stop work and to report to the company physician. This swelling partially subsided and then began to increase. The testis was removed and the patient was given treatments with X-ray until the time of his death nine months later. The tumor was a teratoma.

A man, aged 20, received a blow to the left testis while playing football five months before admission; six weeks later another blow from a tennis ball occurred. This time he was carried home and there was swelling of the testis together with pain and tenderness. Several weeks later, while boarding a street car, he was jolted and strained, following which the local discomfort returned. His physician removed two ounces of blood from the scrotum and he was sent to the hospital where a simple orchiectomy was done. In about 18 months he returned with a large retroperitoneal mass and died in a few days.

It is generally felt the prognosis is poor in these cases of testicular tumor. A few cases are reported in which simple orchiectomy has been followed by apparent recovery. Grassman reported a series of cases, most of which occurred among workmen who were particularly subject to injuries and bumps of the testes while at work. Dew also, reports a large number of cases in which trauma seemed to have a definite relationship. In Bentley's own series of cases there were two so definitely linked with known trauma that compensation was promptly allowed under the Workmen's Compensation Law.

In a series of 100 cases reported by Tanner, 22 gave a definite history of injury to the testis. According to Tanner's figures the right and the left sides are affected with about equal frequency but the involvement is usually unilateral.

Kilfoy's cases were tabulated in two groups: 10 were surgical and 12 were treated medically. In the surgical group, 30 per cent gave a history of injury. In the medical group, 16.6 per cent gave a history of injury—an average of 23.3 per cent.

McNally gives as his opinion, that the exposed position of the testes renders them liable to injury. Four patients of his series (of 20 cases) gave a history of injury (25 per cent).

Rolnick in a discussion on this subject stated: "Last year I looked over the records at the Cook County Hospital of tumors of the genital tract and among them I looked up tumors of the testes. Of 12 patients operated on during the last two years, in four there was a definite history of trauma." (33⅓ per cent)

Rea (in 1931) made an extensive study of 76 cases. There were 29 or 38 per cent which gave a history of some variety of trauma. He quotes Kober who found a history of trauma in 28 of 114 cases (24 per cent). He also quotes Dean who found a history of trauma in 11 of a series of similar size.

Wangensteen quotes Coley (W. B.) who believes trauma is a factor in one-third of the cases of malignancy of the testis.

Cairns (London), Hunterian Professor of the Royal College of Surgeons, observes that in 14 of the 79 cases in his series, *in which the clinical history was recorded* the testicular enlargement followed, or was first observed, shortly after a local injury. (17.7 per cent). He goes on to say that other observers have obtained a history of injury in as many as 50 per cent of their cases.

Ewing, Professor of Pathology, Cornell University Medical School states in a learned article on "Teratoma of the Testis and Its Derivatives": "The belief in the genuine importance of trauma in the origin of these tumors is rendered more acceptable in the light of numerous observations in experimental morphology which show that the parthenogenetic (reproduction without sexual union) development of frogs' eggs may readily be incited by trauma."

Kelly and Heuper observe that, in cases in which the development of a testicular tumor follows the trauma several months later, a relation between trauma and tumor formation cannot be absolutely denied.

This present study consists of 51 cases hitherto unreported. Nine were briefed from the records of St. Mary's and St. Luke's hospitals in Duluth. Four of the nine gave a definite history of prior trauma. The intervals between trauma and treatment were 10 weeks, 10 weeks, five months and 11 months. In the other five cases the record does not state that an inquiry was made concerning trauma.

In the total of 51 cases are included the nine cases above mentioned, and, in addition, cases biopsied or autopsied by members of the Pathological Department at the University of Minnesota. Most of the clinical follow-ups have been obtained through correspondence with physicians in charge of the cases in Minnesota, Iowa, North Dakota, South Dakota and Montana. I wish to acknowledge here the co-operation and courtesy extended me by these physicians in this work.

In 35 of the 51 cases (68.6 per cent) there are histories of prior trauma. In 16 cases a history of injury is not given.

The early symptom of enlargement or swelling which is cited by other authors was mentioned in 32 cases of this series (about 64 per cent) while pain was mentioned in only eight. Pain in the late stages of the disease, however, is a very prominent symptom being present in nearly all the cases.

There was one case of atrophy of the testis following injury and this testis was the seat of a teratoma later. There were two cases of tumor plus hematoma and one case of tumor plus hydrocele. Slow growth was mentioned in 18 instances (about 36 per cent).

The records show concerning the time interval from the date of admission back to the date of injury or of onset or when the tumor was first noticed that:

Ten patients consulted the physician within five months after onset, nine patients consulted the physician within 11 months after onset, 11 patients consulted the physician within 17 months after onset, two patients consulted the physician with 18 months after onset, three patients consulted the physician within two years after onset.

In other words approximately 70 per cent sought aid within a two year period after injury or enlargement and of these, only 10 (about 20 per cent) sought aid within the first six months. A few scattering cases show histories ranging as high as 31 years, Although the prognosis is usually bad. One man of 24 was struck by a baseball six years before admission in 1921. This event (above referred to) was followed by atrophy. After a period of six years a teratoma developed in the same testis. An orchiectomy was performed followed by X-ray therapy and this patient is living at the time of writing.

One man of 38 received an injury six years before admission followed by testicular enlargement; then a second injury occurred while on horseback six months before admission. He was found to have a hydrocele. After tapping the hydrocele there was revealed a hard tumor (embryoma). This patient is living 14 years after his original injury and eight years after orchiectomy. There is no history of the use of X-ray therapy in this case.

In one case there was a tumor in one testis and tuberculosis in the other. There were two cases of bilateral tumor; both are dead. Pierson collected 46 cases of reported bilateral involvement and added one of his own.

All of the patients had orchiectomy and nine received X-ray therapy subsequent thereto.

One patient of 27 received an injury while playing football three years before admission. A small mass, stated to be smaller than a pecan, was found on examination and orchiectomy was performed at once. The operation was followed by X-ray therapy but the patient after a total period of four years following injury died with metastases.

The pathological types of the tumors in the whole group were as follows: 25 cases were of the mixed tumor or teratoma type. Thirteen cases were listed as embryoma.

Three cases were listed as carcinoma. Ten were postmortem metastases. Some were admitted moribund or with gross clinical manifestations of advanced metastases and with clinical histories of prior orchiectomy.

Postmortem involvement was as follows:

POSTMORTEM INVOLVEMENT

Carcinoma Cases			*Sarcoma Cases*
Adrenals	1		
abd. nodes	7	a	
Femoral Space	1		
Heart wall	2		
Inguinal Nodes	1		Hilus glds. liver
Kidneys	4	d	Kidney
Liver	4	c	Mesenteric
Lungs	5	b	Skin
Mediastinum	2		Thyroid
Neck	2		Vertebrae
Pancreas	2		
Pleurae	1		
Pre-aortic nodes	2		
Spleen	2		
Thyroid	1		

It will be noted from the post-mortem findings that the abdominal nodes, the lungs, liver and kidneys are more vulnerable than the other organs in the metastatic process. A few postmortems in sarcoma cases were tabulated and are presented for comparison. It may be noticed the skin and the vertebrae were not involved in the carcinoma cases.

MORTALITY TABLE

Showing Length of Life in Months or Years

Months										Years	
3	4	5	6	6-8	8-10	10-12	12-18	18-24	2-5	5-10	over 10
			2	1	2	4	5	5	7	2	2
			9/30 = 30%				19/30 – 63.3%		26/30 = 87.3%	4 13.3% 10 cases are living now.	

A glance at the mortality table will show that 30 per cent died within 12 months after discovery; 63.3 per cent died within two years; 87.3 per cent died within five years and 13.3 per cent lived past the five year period.

There were 10 of the 51 cases reported living at the time of writing and these are tabulated below:

Ten cases reported living:

AGE	Trauma	Symptoms	Time Interval	Oper.	Radiation	Living	Path.
	Lifting	Pain & swelling	14 mos.	orchiectomy	No	8 yrs.	Mix tu (Ca. type)
25	Kick basketball game	Tender after injury	15 mos.	"	No	18 yrs.	TT (Mix tumor)
29	No Hist.	Swelling	4 mos.	"	No	15 yrs.	TT
22	Blow		3 mos.	"	Yes	15 yrs.	TT
40	Plowhandle	Swelling	4 wks.	"	Yes	8 yrs.	Ca (Embryoma)
38	1-6 mos. 1-6 yrs.	Swelling	6 yrs.	"	....	14 yrs.	Ca (Embryoma)
53	No Hist.	Swelling	1 yr.	"		6 yrs.	TT
25	Blow	Swelling	1 yr.	"	Yes	5 yrs.	Ca (Embryoma)
24	Blow	Atrophy later swelling	6 yrs.	"	Yes	20 yrs.	TT—Ca. Type
42	No Hist.	Swelling & pain	....	"	No	2 yrs.	TT (one) Tbc other

Seven of the ten living cases had prior trauma. The time interval between onset and treatment was moderately short except in the two six-year cases. These two I have described on a preceding page. Four of the living patients received X-ray therapy. It will be noted that all four were living five to 20 years after injury. It will also be noted there were three patients not irradiated but living 14, 15 and 18 years respectively after onset. One of the latter received surgical treatment four months after onset and one six months after the more recent of his two injuries. One patient received orchiectomy and X-ray therapy four weeks after onset.

Owen in discussing the biologic diagnosis of teratoma testis gave his results in ten of 40 cases reported from Veteran's Bureau patients. These were given X-ray therapy and checked with Prolan tests.

Prolan A and Prolan B do not occur in normal male urine. Zondek and many other workers have shown that these hormones do, however, appear in the urine of men having teratoma testis, a point of diagnostic significance. These hormones are measured in mouse units and the quantities indicated by the figures in the following table tend to show the depleting effect on metastatic involvement produced by X-ray therapy. The variability of Prolan before and after threatment is apparently a quantitative indicator of remaining metastatic involvement and a guide in the prognosis.

The tabulation follows:

10 CASES X-RAYED. CHECKED BY PROLAN TESTS (OWEN)

Age	R L	Injury		Orchiectomy in all X-ray to:	Prolan Before	Prolan After
37	L	Yes		Stump-abd. &	500 MU	
				mediastinum	200	
34	L	O	1000MU	Abd. Ing. region	500	
44	L	O		Stump-abd.	3000	Mass in L. hypogastrium.
45	R	Yes		Stump-abd.	000	
					200	Three months later.
53	L	Yes		Stump-abd.	1000	
40	R	Yes		Stump-abd.		
				mediastinum	1500	
34	L	O		None advised	100	or less. No X-ray at any time.
34	R	O		Stump-abd. me		
				& L scap. reg neg		5 months later neck glds. and all other glands.
45	R	O	16000	& L scap. reg moribund		Metastases to abd. and lungs.

Both Lick and Owen urged vigorous irradiation before the orchiectomy. Owen asked for a follow-up prolan test of the urine in his cases every two months following orchiectomy as an indicator for the X-ray therapy.

Henline believed a diagnosis of tumor of the testis can be definitely made by means of the Zondek method. He also believed the pathological type may be determined before operation by a quantitative estimation of prolan A excretion.

Some of these tumors are radio-sensitive, some radio-resistant. Herger and Thibaudeau found the embryonal types most radio-sensitive. These men are also impressed with the value of the Zondek test as a diagnostic measure.

Desjardins, Counseller and Gianturco believe these cases should be discovered earlier and more often by more thorough general examination. They speak of the mortality of 11 per cent where radical operation is done which includes orchiectomy and extirpation of the abdominal nodes, whereas embryonal carcinoma metastasizes first to the nodes near the celiac axis well out of reach in the extirpation process. They found that orchiectomy combined with X-ray therapy was superior to other methods. On the whole they believed that X-ray treatment alone seems preferable for embryonal carcinoma, but for mixed tumors, or teratomas, surgical removal combined with thorough irradiation.

Summary

It is found in this series of 51 cases of carcinoma of the testis that 68.6 per cent gave histories of prior trauma. Many histories are silent on the subject of trauma. In some of these it may have been a factor. In some of the traumatic cases the trauma may not have been a factor in etiology. Until some experimental or other proof is elicited the etiology will remain unsolved. Clinical evidence, however, in this and in other series of cases is gravely suggestive that trauma has been the prime causative factor in carefully worked-out instances. It should not be blindly denied.

Early symptoms unfortunately are usually absent, which brings into prominence the necessity for more careful examination of the scrotal contents in general examinations. These cases are not so uncommon as formerly supposed. A small tumor may be associated with widespread metastasis. The record shows that only one-fifth of the patients sought medical aid within the first six months after onset. It also shows that the abdominal nodes, the lungs, liver and kidneys partake most freely in the metastatic process. This gives a guiding hint to the roentgenologist in administering X-ray therapy.

The prognosis to date has been unsavory. Thirty per cent died within the first year. Sixty-three per cent died within the first two years and eighty-seven per cent died within the first five years. Four of the ten living patients received X-ray therapy in addition to orchiectomy. Three patients were not irradiated, but two of these received surgical treatment early, one four months and the other six months after onset.

Tests for prolanuria offer a distinct aid in diagnosis and in prognosis and should be resorted to whenever possible. The points to be particularly stressed are early diagnosis and treatment with particular emphasis on vigorous X-ray therapy.

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Discussion by Dr. Donald Kaump, Resident Pathologist, St. Luke's Hospital, Duluth: I would like to point out, as others before me have done, that almost every male during his life sustains some injury to his testicles while few develop neoplasms. It may or may not be wrong to assume from this that the definite and specific influence of trauma as an etiologic factor must of necessity remain problematical.

I should like briefly to discuss the pathology and laboratory aids to diagnosis in this particular disease entity.

Incidentally the relation between malignant changes and the position of descent may be summarized to be that intra-abdominal testes appear to be relatively immune while those caught in the inguinal canal show a greater tendency toward malignant change than do those in the scrotum.

Usually the tumor starts as an ovoid type of growth following the usual shape of the testicle. It is most frequently a smooth growth largely because the tunica is a restraining factor. With involvement of the tunica, however, the growth may be nodular. There will often be a thickening of the spermatic cord due to increased vascularity and later to actual involvement. Perhaps the most striking feature is the sensation of great weight which the tumor possesses. Metastasis, as you know, is by means of the lymph channels of the cord to the retroperitoneal nodes, and by the blood stream. Sometimes the first symptom noted is due to pulmonary metastasis or to pressure from an enlarging abdominal tumor. The inguinal nodes are not involved unless the tunica has been injured either by direct extension or by surgical trauma.

In the differential diagnosis we must consider four conditions, all of which may usually be ruled out on the basis of clinical observation and laboratory tests. These are tuberculosis, syphilis, hematocele or hydrocele and incarcerated hernia. Tuberculosis usually starts in the epididymis, shows a nodular vas, has a relatively rapid growth, is usually painful from the start and the patient usually has a fever. In addition there is an accompanying generalized genital tuberculosis. Late, the skin may become involved and sinuses develop. Malignancy does not follow this course.

The diagnosis of syphilis may be made on the basis of a history of a primary sore, a positive flocculation test or a therapeutic trial on medication. It must be remembered, however, that malignant growths which are breaking down may also give a positive Wassermann.

The other condition may be ruled out by clinical examinations.

On removal, a firm ovoid tumor of varying size and dirty white to gray in color is noted. On section this may show multiple cysts containing mucoid material; or cartilage, hair, bone or teeth may be encountered.

Concerning the origin of these tumors much has been written. Briefly we may say that opinion has divided into two schools of thought. The first holds that the tumors are true homologous types arising from adult spermatoblasts. The second theory, which has its outstanding American champion in Ewing, is that these tumors all arise from all three cell layers. Thus any tissue in the body may be reproduced, with the so-called homologous types being a one-sided development of a particular cell or part.

For simplicity in classification that given by Tanner is perhaps the most readily understandable.

A. Malignant.
  1. Carcinomatous—large cell, large nucleus type undoubtedly closely related to
  2. Mixed tumor type
    a. Tumors containing cartilage, cysts, glands, etc.
    b. Ordinary glandular structure tumors
    c. Chorioepithelioma

B. Benign
  1. Dermoid
  2. Epithelial
    a. Adenoma of seminal vesicles
  3. Mesoblastic
    a. Interstitial cell tumors.
    b. Fibroma
    c. Lipoma myxoma

This is essentially a classification according to Ewing, with the addition of the carcinomatous type noted above, being a concession to those who have described tumors in which only cells resembling those of the seminiferous tubules are noted.

Some years ago Zondek noted substances in the urine of pregnant women which would produce definite changes in the ovaries of immature virgin female mice. These changes are essentially a continuation of one process which has been divided into three phases. These are as follows:

1. Swelling and hyperemia of the Graafian

follicle with formation of distinct cumulus oophorus.

2. Formation of hemorrhage-corpora hemorrhagica.

3. Formation of corpora lutea.

This response is said to be due to the presence of two substances, prolan A and prolan B which are elaborated by the pituitary. The first two steps are attributed to prolan A and the third to prolan B. This test of injecting urine into mice to determine pregnancy, has since been put to a new use i. e., the diagnosis of testicular tumors. Thus prolan A and prolan B may be found in a male where they do not normally exist.

This is usually done in a quantitative manner and consists of injecting into mice, urine or the extract from fresh morning urine. In all a series of six mice is used with varying quantities being administered. Thus we have the minimal amount which will give ovarian changes. The result is then transposed to read as mouse units per liter of urine.

The test is of value as a qualitative test in diagnosis and a quantitative test in determining prognosis, progress and metastatic involvement. In regard to prognosis, the most malignant forms will give the highest reading in mouse units. Irradiation and adequate surgery will lower this reading; however, a reading is of no value unless a period of 10 days to two weeks is allowed for the body to become flushed of its prolan. Metastases will of course give a positive prolan test.

Trends in Student Health*

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Oberlin, Ohio

IT HAS been the custom of our association for the President to address the members at the annual meeting. You would have been spared from the ordeal of listening to this address and the last year's had you made the regulation that ability to prepare and deliver an address should be a prerequisite for election to this office. However, I hope I may leave with the members some ideas that to me seem important in determining the future existence and usefulness of the association and its component parts.

First of all, I want to express my gratitude for the honor conferred upon me and to assure you of my appreciation of the important responsibilities which the office involves. This organization of health service directors was established fifteen years ago upon an unusually sound foundation. It was established because of the demonstrated need for a service on the college campus which the then current facilities of the institution could not furnish. To be sure, there were excellent departments of physical education and hygiene, and these departments continue to grow and to increase in their usefulness to the college and to the student. In these departments we had facilities for effecting certain phases of health conservation before the health service was inaugurated. However, these agencies in the college were not adequate. With a health conscious public and an actually medically conscious parent constituency, with tremendous advances in knowledge of immunology, college administrators became aware of the imperative demand for a clear cut medical point of view in dealing with the peculiar problems of physical and emotional illness among students and in prosecuting a complete program of health conservation in the college. As health services proved their value to college administrators and to student bodies their number increased and the association has steadily grown to its present position of influence since its organization in 1920.

In the early days of college health service history we discovered in this new department, facilities for dealing not only more effectively with the particular health problems peculiar to the college and university campus, but we recognized this unit as a new weapon which if effectively used would become a valuable addition to the armamentarium of medical science in general, in its battle against human disease.

I am sure it has been in all our minds that in the student health service are offered opportunities to observe health and illness under conditions never before presented in the aggregate. When the student's visit to the physician is not incident upon the payment of a fee, and when many other influences are brought to bear to encourage him to procure professional advice upon the earliest appearance of any deviation from the normal, we immediately make available for observation by medically trained minds a host of subclinical variations from the normal. Unfortunately these observations are of practically no interest or value to us now because we have no knowledge of their meaning. Usually they are complacently disposed of by assuming that they lie within the limits of normal. These minor differences will become of immense value in the study of disease and prevention when we have learned to properly evaluate them. One reason that the annual routine physical examination has not reached widespread application is because our findings have no significance, and, unless the person to whom these apparently insignificant changes are presented, actually, seriously and energetically makes a study of them, their value will remain hidden. Every disease syndrome has its subclinical form which is constantly being presented and regularly defies recognition. These subclinical entities are a major problem in epidemiology. In proof of this we need think only of the so-called "walking" typhoid, measles and poliomyelitis.

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*Presidential Address, Sixteenth Annual Meeting, American Student Health Association, New York City, December 27, 1935.

Most scientific advances have been achieved by careful study of minute differences, differences which the average observer considered within the limits of normal and therefore of no significance. Many scientific advances have been delayed years because of this attitude. Let us take for an example one of the recent revolutions in medical science. From the time of Pasteur it had been the general rule for the bacteriologist to regard the individuals composing a given pure strain of bacteria as identical. So, when a culture was spoken of as virulent it was supposed to be virulent as a whole, and little attention was paid to its individual members. They were tacitly assumed to possess this charactertistic virulence in common. Again, as a culture attenuated by passage on artificial media the formerly virulent germs were assumed to lose their invasive power simultaneously and uniformly. This point of view persisted in spite of the fact that differences in characteristics of the same bacteria had been roughly observed since Robert Koch admitted in 1890 that some bacteria showed variability. With this conception of uniformity pervading the whole bacteriological atmosphere differences of virulence received little attention. Then, about fifteen years ago a particularly careful student cultivated the rabbit septicemia bacillus and found that after four days culture without transplanting, this pure culture contained organisms identical with the organisms originally planted, but in addition to this contained an organism which produced on media a colony only slightly different in appearance. This then was injected into a rabbit and the animal became only slightly ill when previously the inoculation had resulted in rapid death. Further study proved that this organism, which was a direct descendant of the original pure culture of virulent septicemia bacilli, performed quite differently culturally and antigenically. Here we have a case where a minute variation in nature was pursued with enthusiasm and perseverance, and resulted in our present vast fund of valuable knowledge of bacterial dissociation. I think bacteriology has a lesson for us here. If Arkwright and DeKruif had allowed their observations of slight variation from the normal to be cast into the discard we would not now have our new science of immunology, we would not know why our whooping cough vaccines have failed to produce effective immunization, we would know even less about the pathogenicity of the streptococcus, and we would not realize the fallacy of relying too confidently on our present typhoid vaccination.

I think you will agree that minor clinical variations are as susceptible of investigation as differences in the biology of bacteria, and this is a problem for each one of us in the field of student health. The field of medicine is replete with illustrations like the one I have cited. Already studies from our own health services have resulted not only in value to our college population, but have received application in allied fields of knowledge and have been substantial contributions to scientific medical progress. But the major problems still remain a challenge. We see then that we are working in a field that offers many possibilities of discovery with no more elaborate equipment than the naked eye and an energetic mind.

It seems to me here that a look into the future of disease prevention and medical practice might help us to get our bearings and more effectively direct our efforts. There has probably never been an age when ideas about the relationship of the profession to the public have changed as rapidly as they are now changing. Most of us remember quite clearly the time when no little odium was attached to the accepting of a salaried or so-called contract position in medicine, and no ambitious medical graduate could think of carving out a career in the field of student health. Minor illnesses and emotional maladies were beneath the dignity of the good medical graduate. Surely, he reasoned, the only method of establishing oneself as a leader in the profession was by way of a series of gastroenterostomies on the one hand or pernicious anemia on the other. But the order is changing and particularly at the present time the transition is rapid. I think it is quite clear to anyone who has studied the trends in the last very few years that in the future an increasing amount of lay control will be exercised over the non-professional phases of medical practice. This leads us to the conclusion that a much larger proportion of medical practice will be conducted on the salary rather than the fee basis, with the not wholly unrelated corollary that preventive medicine will find its way more abundantly into the every day work of the doctor.

The increasing interest of the public and the profession in the prevention and treatment of minor illness has been partially responsible for the recent activity of the federal government in its current survey of the incidence of illness in general population groups throughout the United States. This is, of course, merely an indication of a trend toward more serious consideration of the mild illnesses.

We, in the student health service have already found ourselves in a particularly advantageous position to study these conditions which we see are now becoming of widespread interest. As a matter of fact, if we could reduce to a mathematical formula the things we foresee as administrative and professional tendencies in the near future, we could see in this formula, without too much transposing of x and y the identical formula of a model of our present typical student health service.

We find ourselves, then, working in an enterprise that has proven itself essential to the present and probable future demands of a particularly influential unit of our society. This enterprise offers peculiar opportunities for making contributions to many fields of knowledge. It seems quite obvious that up to the present our policies have been wisely conceived, and have been thoughtfully executed. Our future will depend on how we meet the challenge to contribute constantly in the changing order.

Pre-College Health Preparation of Students*

Haven Emerson, M.D.
Columbia University
New York, N. Y.

YOUR president's courtesy in letting me choose a topic to my own taste puts me entirely at your mercy, for the measure of my failure to either interest or inform you is my own rashness in entering areas of experience and opinion for which I can hardly claim to have either chart or compass.

You who accompany and observe the cream of America's youth at the threshold of their productive careers are in the best possible position to record the inadequacies and errors of those who have stood guard over the growth and development of these same young people in their earlier years.

You are spared contact with the grosser misfortunes of those eliminated by examinations from the privilege of higher education, those with structure and function, with spirit and mind, too warped and deformed to be passed on to your hands.

Perhaps you are satisfied with the quality of fellow creature that reaches you. Inheritance, conditioned reflexes, nurture, precept and example have already made too rigid the model you are asked to further mould in mind and body. What can be done you doubtless have accomplished, to protect against preventable dislocations of life, against attack of parasite or false ideas, to lift into a higher level of ambition and accomplishment of health, to provide the substance of ideals and examples which will serve for many of the swiftly passing years.

However, you are faced in each entering class by evidence which must often make you wish to unravel the confusion of the student's past, to disentangle fact from falsehood, to redevelop, reeducate, and retroactively create a simple faith in the elemental verities of a physiological way of life.

Owing to the adaptability, the resilience, the urge to succeed which are the essence of youth, you find an infinite variety of healths, perhaps as many as there are of disease. Every good rule of conduct has been broken, apparently without disaster; mediocrity appears to be the lot of the few who answer "yes!" to your leading questions, as to observance of standard methods of healthy living.

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*Presented before the Sixteenth Annual Meeting of the American Student Health Association, New York City, December 27, 1935.

There is infinite variety, no common philosophy, principle, faith or belief in the laws of Nature. Yet upon this mongrel and variegated product of an unreasoned and unreasonable past are you to build what Sir George Newman refers to as "a better tabernacle for the soul of man to inhabit."

What has gone before? Who has led these youths to your hands? Has there been an idea of enduring worth offered, and is any such now accepted by them? Where and of what nature was their first glimpse of the book of life? Was at any point in their most rapid history the insatiable curiosity of the child utterly satisfied as to each body part, and its need and use, its protection and development?

Did the kindergarten or high school first register on the kaleidoscope of daily experience so that the human engine became more explicable as it proved more capable and controllable?

What is the evidence in your hands of some previous orderly progression of mental and bodily experience which offers a foundation upon which you may build the cultural and decorative details of perfect health understanding, in terms of the man, the family, the race, the nation, and his fellow men about the world?

Is it possible for you to build on the structure offered you? Is it safe for the maturing but still uncompleted adult to face college so ignorant of himself? Can society afford the blunders and misfortunes that are in store for those who have traditions and habits, rather than a reasoned intelligence to guide them? These and many more are the questions you must annually ask yourselves.

What can you do about it? Is the problem yours, solely, or at all? Why should you worry or take thought of the antecedent hazards and inadequacies of the youth that falls to your lot to protect?

It is just these queries which seem to me most insistent for I cannot imagine you have not voiced them often to yourselves. If you could order all things to your liking I imagine the elementary and preparatory schools would be quite different, at least in respect to the example and precepts of health. What I offer for your passing thought is hardly more than a theory to be tested I hope in the relentless furnace of practical experiment and experience.

The greatest triumphs of applied physiology have been in the life of infants, and the greater part of our present-day social disorder can be traced, I believe, to the success in saving babies to become grandparents. Never in historic times were young children so rare, or so precious, or so likely to survive. We may properly think ourselves as at a peak of health accomplishment, with further and higher objectives clearly in sight.

What has so far been accomplished has been largely through law and order, through material advance in the environment of life, by the great blessing of the bacteriologist, but hardly to an appreciable degree by the individual *homo sapiens*. Sanitation has been effected by engineers, appropriations, laws, and has made life admirably secure for the mass by amazing progress in both its science and its art.

Hygiene or the relations of individual conduct to personal health has remained almost motionless, recording few if any notable improvements in method or objectives since the time of Plutarch or before. In fact there is good reason to suspect that the average of personal hygiene in respect to the habitual use of non-nutrient drugs, drinks and smokes, has distinctly fallen within the present generation.

Be that as it may, the distinction I would lead you to is that which separates the assets of public health which have resulted from doing things for people, from the liabilities which can be balanced or overcome only by individual performance in one's own interest. At that point we must choose between legislation and education. We must decide what nature of social order we shall achieve, one of laws of course, but also one in which a law that is a social or civic sanction will follow general understanding, instead of running counter to it or ahead of it.

We have at present really ample authority under the police power of the sovereign states to do our utmost, and achieve the highest goals for health. We need, not new, or more, or stronger laws, with teeth, or merely edentulous gestures of partisan politics, but a widespread understanding of the laws of living creatures.

For this an evolution, yes, even if necessary, a revolution in our public and private schools is necessary. One can see the little beginnings. There are nature study courses, here and there high school laboratories where the elements of physics and chemistry and biology are taught, but the share of such in the total mind-life of the school child is pitifully small.

It would seem to me the part of wisdom, yes of pedagogic methodology, to prepare soundly for the inevitable complexities of life thrust suddenly upon boys and girls by the onrushing of their developing bodies and emotions. As it is today we attempt to take the high school boy and girl into that most difficult, delicate, complicated explosion of the psycho-biological unit, without their having met and marvelled at the ameba, shared in the excitement of the planted seed miraculously developing its foreordained leaves and bloom, or proved the bearing of water, food, rest and cleanliness upon the survival of kitten or chick.

No! I have no intention of going off into the psychology of sex education. What impells me to think, or at least to speak, out loud to so sympathetic a gathering is the comprehensive inadequacy of the preparation for a right way of living permitted under the prevailing curriculum of the grade and high schools.

No topic included in school teaching demands so early a beginning, so persistent and balanced a development from grade to grade, so high a level of mental discipline, such practical demonstration and busy imagination as does the study of living matter.

Without a background of observation and reasoning, inculcated by persons saturated with a biological understanding, year in and year out from kindergarten to the senior high school, it will remain impracticable to develop in the college man and woman that perfection of performance which makes health the highest art of a handsome and happy way of life.

What can you do about it? Well! I suggest that you make a declaration by well-considered phrases to the presidents of your institutions, disclosing to them in no uncertain terms the depth of ignorance as to health and its achievement which afflicts the candidates for an academic society.

Take the students as they come, ask a few critical questions to reveal the extent of their information about themselves, questions of body and of mind, of insides and outsides, of what goes in and what comes out, and the reasons. You'll soon find how many college students are uneducated, unfit to avail themselves of mental pabulum, while they remain at the road-house level of doughnuts and coffee in their personal habits.

It is not enough that you should have the skill and power to protect them against the hazards of their infantilisms. You are inescapably educators, and a primary duty of the college is to raise the level of the school.

No evidence appears to me to be more convincing than that the common school curriculum is distorted, ill-balanced and unproductive of real education in living, because it has been dominated by generations of teachers who have grown up themselves untouched by the least element of biology.

You are guardians of the threshold, the protectors of a gateway to high opportunity. Your work is of phenomenal importance. You reveal a laudable pride in your accomplishment. Thousands benefit by your skill in teaching and in your services to the sick.

I say to you that you are not doing nearly enough, and that you will not begin to make the full power of your positions effective until you use the parade of youth through your hands as a means to a higher performance of preparatory education.

Every other department of college or university voices in no uncertain terms its dissatisfaction or content with the product it is asked to perfect. Analyze the performance, and the understanding of your students as though their lives depended more on knowing the truth of their bodies than on mastering calculus or deciphering a cuneiform tablet from Babylon.

The health of the future will not be a health officer's product, a negative achievement of reduced death rates, but the accomplishment of individuals who choose their ways of life with understanding, according to their inheritance, their ambition to survive and be superior, and consistent with the immutable laws of human biology.

Biology is greater than civics, home economics and a host of useful and competing school topics. Our society and the nations that are everywhere our neighbors, will owe an increasing debt to those who can make the science and art of curative medicine less and less necessary, by reason of the understanding in childhood and youth of the good way of life.

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DIAGNOSIS AND TREATMENT OF ALLERGIC DISEASE

Successful prevention or cure of or relief from any disease afflicting mankind has seldom been achieved without a thorough understanding of the etiology and pathology of that disease. Clinical phenomena are interpreted in terms of knowledge of the time so that as basic knowledge grows, earlier interpretations may become obsolete. Experimentation in immunology in the latter part of the last century led to the discovery that a peculiar state of hypersensitiveness to protein substances could be artificially induced in experimental animals. Richet termed this phenomenon anaphylaxis, while Dale, Otto, Rosenau and Anderson, *et al*, contributed to its explanation on an immunologic concept.

It was almost a natural sequence to the work on experimental anaphylaxis on animals, that forms of human hypersensitiveness should have been interpreted in terms of knowledge of that time. Meltzer in 1910, on the basis of the apparent similarity between the dyspnoea of asthma and that observed in guinea pigs dying of anaphylactic shock, suggested that true bronchial asthma was a phenomenon of anaphylaxis. Wolff-Eisner had already suggested anaphylaxis as an explanation of hay fever.

Painstaking investigations at the hands of careful observers have failed to establish the fundamental criteria of anaphylaxis in clinical human hypersensitiveness. For this reason other terms as allergy (altered reactivity) and atopy (strangeness) have been proposed as designations for conditions of human hypersensitiveness. These terms have frequently been mistaken as synonyms for anaphylaxis.

Nothwithstanding the differences involved in the mechanism of anaphylaxis and allergy (atopy), an important feature of both is the immunologic basis.

Without regard to this concept investigations into the nature of allergy have escaped from the realm of immunology. We now have proponents of acid-base imbalance, endocrine imbalance, increased sugar tolerance, calcium defiiciency, imbalances of inorganic ions, deficiency of vitamins, *etc*., as the underlying cause of allergy. Therapy in accordance with these concepts has not produced any convincing results.

The method which has given the most consistently satisfactory results in the management of the various allergic manifestations is that which recognizes the immunologic basis. This method necessitates a familiarity with the syndromes evoked by allergic reactions and demands the discovery of the exciting cause or causes for each individual sufferer.

The allergic nature of true bronchial asthma, urticaria, angioneuratic edema, seasonal hay fever, vasomotor-rhinitis, eczema, migraine, and certain forms of indefinite gastro-intestinal symptoms including pain, nausea, and tenderness, seem definitely established.

An allergic investigation cannot cure all the chronic incurables but it will bring relief to many cases previously considered incurable.

For patients with asthma, hay fever, eczema and urticaria, an allergic investigation is of first importance. When migraine persists after all other possible causes have been ruled out; when chronic indigestion has been declared functional; when a running nose persists in spite of the usual medical and surgical treatment; surely the individual who is thus afflicted is entitled to the relief which may be offered by an appreciation of their possible allergic nature.

Ralph V. Ellis, M.D.

GALL TRACT SURGERY

The current medical literature reflects an awareness that all is not not well with cholecystectomy as it has been vigorously utilized among us for the past two decades. Skill and a low mortality have not been sufficient to offset the annoying circumstance attendant upon a failure to accomplish for the patient much that was promised, or prevent the recurrence of clinical symptoms that should have been banished if the gall bladder had been the primary source and offender. Were it so, then the earliest removal would yield the maximum of success both to the patient and the doctor. And with the obliging accuracy and ease of application of such a test as the Graham-Cole roentgen technique, the qualified surgeon had at his disposal an objective confirmation of his clinical impression that not infrequently gave the patient the "coup de grâce" in terms of making up his mind to allow a peaceful but aggressive entrance of his abdomen. However, in retrospect, both surgeons and internists (based largely upon end results) are nearly convinced that "Group I cholecystitis is normal"; and our best roentgenologists have come to an interpretation based upon whether the gall bladder functions (secretes the dye), and whether there are shown in addition stone shadows in a functioning or a nonfunctioning gall bladder. The roentgenologist desires to leave to the clinician and surgeon, through an interpretation of the patient's condition and symptoms, the medical or surgical needs.

Another point of view is gained, however, from a review of the results or late disastrous sequelae of neglected cholelithiasis, cholecystitis, hydrops, pancreatic refluxes and hepatitis, not to mention malignancy. Avoiding radicalism, cholecystectomy, done at the right time, is an excellent health restoring procedure. The time comes when (quoting Charles H. Mayo and the "Mikado") "The punishment should fit the crime."

Late gastroenterostomy for a burned-out peptic ulcer (chiefly duodenal) was a good operation and still has its place; but when it is done on the basis of an early roentgen diagnosis of ulcer it is apt in ulcer-forming individuals to yield more confusion than relief. It appears that much well known to physiologists has not yet found a place in our medical and surgical consciousness, but the time is rapidly approaching when we shall do better: our patients will be defended as well against dietary inadequacies as exaggerations; constitutional habitus will receive due attention, and those equal to restraint will accept guidance; the surgeon will retain his skill but determine his operation and its extent, with a judicious clinical evaluation, with full consideration of the stage of the patient's disorder and sufficiency of his vital organs. In the meantime, the surgeon will drain more gall bladders when in doubt, and pay more attention to the state of the bile ducts, the liver and the pancreas.

E. L. T.

MINNEAPOLIS SURGICAL SOCIETY

The fourteenth annual dinner meeting, commemorating the anniversary of the foundation of the Minneapolis Surgical Society, was held under the presidency of Frederick A. Olson at the Minneapolis Club on the evening of February 6, and attended by 220 members and guests Among the latter were W. J. and C. H. Mayo, to receive honorary memberships; D. C. Balfour, president of the American College of Surgeons; H. B. Zimmerman, president of the St. Paul Surgical Society; Karl Meyer, president of the Chicago Surgical Society, medical superintendent of Cook County Hospital and Regent of the University of Illinois; Harry Klein, vice-president of the Duluth Surgical Society; Stanley J. Seeger, Milwaukee, immediate past president of the Wisconsin State Medical Society and president of the alumni association of the Mayo Foundation; A. R. Metz, secretary of the Chicago Surgical Society and chief surgeon of the Milwaukee railway; W. A. Coventry, Duluth, president and W. W. Will, Bertha, president-elect of the Minnesota State Medical Association, with many others from Minnesota and surrounding states. The guest speaker was Frank H. Lahey, Boston, director of the Lahey Clinic, who gave a masterly address on his views and experiences in the diagnosis and surgery of carcinoma of the colon and rectum. Vocal selections by a professional male quartet were interspersed between the various numbers and there was a short "Interval of Silence" in memory of two members, Arthur T. Mann and E. Starr Judd, who had passed away within the year. The evening was closed with the showing of motion pictures of outdoor life from "Field and Stream."

G. C.

PHYSICS SELF-ADMINISTERED DANGEROUS

Laxatives, physics and purgatives should never be taken except as and when prescribed by a physician. This message should be carried with emphasis and repetition to every human being.

Granting that a certain regularity of bowel movements is necessary to good health, the converse is not true. Health cannot be assured by a simple maintenance of the function of evacuation. Indeed it is a dangerous thing to restore such regularity without a careful and serious consideration of the underlying cause of its failure. Diagnosis then is the important thing. Surgeons have been so impressed by the harm done by physics in unsuspected cases of appendicitis that they are urging a campaign of enlightenment.

Would that the practice of medicine were as simple as the laity think it is. Even though a laxative may be indicated, that is not enough. Some act in one way, others in another. Some may save life and health, others destroy. Physicians can not and do not condone the promiscuous use of a family physic—they know its harmful effects and fear its consequences. There is no short cut, short of the physician's assiduous guidance.

A. E. H.

THE EDITOR OF THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

To insure a better public health, we must examine and use our preventive measures among apparently healthy persons. In order to accomplish this end, persons without medical and nursing training must be informed and health education must be extended beyond the confines of our institutions for professional training. Information concerning the health of the individual and the public at large must be provided through lectures, magazine articles, radio addresses, etc.

There is no other group of persons as well qualified to disseminate information concerning health as the members of the medical profession. They have spent long years in studying health in medical schools, and they have taught and practiced and continued to learn more about health as new facts have been discovered. Therefore, the American Medical Association should be considered as the main source of health information. Thus, the editorship of the official Journal of the American Medical Association is in a position which provides an opportunity to keep the physicians of the country informed of new developments in medicine and to revise and even repeat that which has been written many times, but still needs to be brought constantly to the attention of the American medical profession. These are the chief duties of the editor of the Journal of the American Medical Association. He could be content to do this work and nothing more.

However, there is a steadily increasing demand for authoritative information concerning health. All normal mothers and fathers want to know how to prevent illness and death among their children; how to aid their children in the development of strong bodies and alert and active minds, to mention just a part of the situation. Obviously, the editorship of the Journal of the American Medical Association carries much prestige, and is a valuable asset in meeting the demands of the public for health education. Thus, the present editor, Morris Fishbein, holds a unique position in the medical and health education of America. But Morris Fishbein is a unique physician; he is ambitious, energetic, self-sacrificing, and has a burning desire not only to continue to provide the American medical profession with the best journal in the world, but also to extend health education to the public everywhere.

As a graduate of the Rush Medical College and having had special training in pathology and carrying professional rank in clinical medicine in one of America's best medical schools, indicates that he is highly trained in the fundamentals and practice of medicine. This is extremely important, for it gives him a basic understanding of disease. Thus, Morris Fishbein is a greater asset to the American Medical Association than that which his position bestows upon him. As founder and editor of Hygeia, he carefully orders and selects the material which is most valuable in disseminating health education to the public. In his syndicated newspaper health columns read by thousands throughout the country, fine educational work is being done. Through his numerous books both professional workers and the lay public are receiving authentic information and trust-worthy advice. On the lecture platform he is recognized everywhere as one of the popular speakers of the day. He is able to hold spellbound the faculty and student body of any of our universities throughout the entire convocation period, on the subject of everyday health. He so impresses his listeners that for months after he has spoken they comment most favorably and express a desire to hear him again. They ask for lists of his publications, particularly his books. His daily columns in the newspapers, as well as his articles which appear in the non-medical magazines are equally popular.

Almost immediately after speaking before a university convocation, he is capable of appearing before a scientific medical group and holding this audience spell-bound likewise. It is not unusual for Dr. Fishbein to appear before a large university convocation during the forenoon, address a luncheon club at noon, speak over the radio, where he is always in great demand, and in the evening deliver the principal addresses before one or more large gatherings.

Dr. Fishbein's name is known to every member of the medical profession and hundreds of thousands of persons outside the medical profession. He is so well-informed, so versatile, and in such great demand that it would be impossible for the American Medical Association to compensate him adequately. Therefore, the fact that newspaper syndicates, first-class magazines, and others, are willing to add to his compensation so that the American Medical Association is able to retain him as its editor and educational leader is entirely to the Association's advantage.

J. A. M.

CAT.

FREDERICK W. VAN VALKENBURG

1898-1936

Dr. Frederick W. Van Valkenburg, physician and surgeon of Long Prairie, Minnesota, was killed instantly and his wife injured slightly when, on February 8, 1936, a truck collided with the car in which they were returning from Minneapolis to their home. The accident occurred on the State Highway just south of Anoka.

Dr. Van Valkenburg was born in Long Prairie on February 21, 1898, the son of Dr. B. F. and Bessie Van Valkenburg. He received his early education in the city of his nativity and soon after his graduation from high school he entered the University of Minnesota to study medicine. His medical education was interrupted by his enlistment in the 812th Aero Squadron with which he went over seas. At the conclusion of the war he returned to his professional studies and received his doctorate in medicine from the Medical School of the University of Minnesota in 1925. His clerkship was spent at the Charles T. Miller Hospital in St. Paul, and both his junior and senior internships at the Ancker Hospital of St. Paul.

After graduation he became associated with his father in the practice of medicine and surgery at Long Prairie. During 1927 he went to the Cook County Hospital in Chicago for post graduate studies in surgery. There, on June 21, he was married to Miss Constance Payte, of St. Paul. In 1933, he began a fellowship in surgery in Philadelphia under the University of Pennsylvania Medical School. Returning to practice in Long Prairie, in 1934, he accepted the post of Resident Urological Surgeon at the Newark City Hospital in New Jersey. He had been in practice only eight months following this training when the fatal accident occurred.

Dr. Van Valkenburg was a member of the Todd County Medical Society, the Upper Mississippi Medical Society, the Minnesota State and the American Medical Associations. While he was in Long Prairie he was a member of the Todd County Medical Advisory and Contact Committee and he served as secretary of the Upper Mississippi Medical Society in 1933. He was a member of the Phi Rho Sigma medical fraternity and of the Masonic Lodge and American Legion.

He is survived by his wife and daughter, Sally, his father and stepmother, Dr. and Mrs. B. F. Van Valkenburg, and a brother, Dr. L. K. Van Valkenburg, a dentist, of Long Prairie. His wife and daughter will make their future home in St. Paul.

In the death of Dr. Van Valkenburg the medical profession loses one of its most loyal and respected members. He was an ardent student and devoted most of his time and effort to professional advancement. His medical knowledge and surgical ability were sources of inspiration to all of his medical associates and his friendship was cherished by all who knew him well. Besides his loss to the profession, Long Prairie mourns his death as one of its major catastrophies.

SOCIETIES

THE AMERICAN CONGRESS OF PHYSICAL THERAPY

The American Congress of Physical Therapy announces its Mid-Western Sectional Meeting to be held at the Mayo Clinic, Rochester, Minn., March 4, and 5, 1936.

March 4th will be devoted to clinical papers; the session will open in Plummer Hall at 9 a.m., Dr. Frank H. Krusen presiding. Dr. Charles W. Mayo will deliver the address of welcome. The following speakers will present interesting papers, as follows:

1. "The Use of Physical Agents in the Treatment of Circulatory Diseases," N. W. Barker, M.D., Rochester.

2. "Studies in Tissue Heating with Short Wave Diathermy," John S. Coulter, M.D., Chicago, and Howard A. Carter, B.S. in M.E., Chicago.

3. "Temperature Changes Produced in Various Tissues of Animals by High Frequency Electrical Fields," Charles Sheard, Ph.D., Rochester.

4. "The Scope of Physical Therapy in Dermatology," Cleveland White, M.D., Chicago.

5. "Fever Therapy," A. U. Desjardins, M.D., Rochester.

6. "Newer Aspects of Ionization Therapy in Perennial Nasal Allergic Disorders," A. R. Hollender, M.D., Chicago.

7. "Physical Therapy in Relation to Orthopedics," M. S. Henderson, M.D., Rochester.

8. Influence of Short Wave Diathermy on the Blood," Disraeli Kobak, M.D., Chicago.

9. "Pathologic Aspects of Arthritis," Ralph K. Ghormley, M.D., Rochester.

10. "Recent Progress in the Study and Treatment of Arthritis," P. S. Hench, M.D., and C. H. Slocumb, M.D., Rochester.

11. "Physical Therapeutic Management of Arthritis," Frank H. Krusen, M.D., Rochester.

On Thursday, March 5, Clinics have been arranged as follows:

(a) 8 to 10 a.m.—Clinic on Fever Therapy—St. Mary's Hospital, Fever Therapy Department, Walter C. Popp, M.D., Rochester.

(b) 10 to 11 a.m.—Clinic on Relation of Posture to Low Back Pain (Corrective Procedures)—Physical Therapy Section, Museum Bldg., E. W. Secord, M.D., Rochester.

(c) 11 to 12 a.m.—Clinic on General Physical Therapy—Physical Therapy Section, Museum Bldg., Frank H. Krusen, M.D., Rochester.

AMERICAN COLLEGE OF SURGEONS' SECTIONAL MEETING AT OMAHA, NEBR., MARCH 11-12-13, 1936

Participating States: Nebraska, Iowa, Wyoming, North Dakota, South Dakota, Minnesota, Kansas and Colorado

Headquarters and Registration at Hotel Paxton

An active Committee on Local Arrangements, with Dr. Herman F. Johnson as chairman, Dr. John W. Duncan as vice-chairman, and Dr. William L. Shearer as secretary, have plans in hand for an excellent meeting.

Following is a preliminary outline of the entire program:

Daily

8:00- 6:00	Technical and Education Exhibits, Corridors and Lounges, second floor, Hotel Paxton.
12:00- 2:00	Medical Motion Pictures, Main Banquet Room, Hotel Paxton.

Wednesday, March 11

MORNING

8:00- 9:00	Registration and Information, Second Floor Lounge, Hotel Paxton.
9:00-12:00	Operative and Non-Operative Clinics, General Surgery, Local Hospitals.
9:30-12:00	Hospital Conference, Main Banquet Room, Hotel Paxton.

AFTERNOON

2:00- 5:00	Hospital Conference, Main Banquet Room, Hotel Paxton.
5:00- 5:30	Annual Meeting, Fellows of the American College of Surgeons, election of officers for each State. Main Banquet Room, Hotel Paxton.
7:00- 8:00	Medical Motion Pictures. Main Banquet Room, Hotel Paxton.

EVENING

8:00-10:30	Scientific Sessions, General Surgery, Main Banquet Room, Hotel Paxton.
8:00-10:00	Hospital Round Table Conference, St. Joseph's Hospital.

Thursday, March 12

MORNING

9:00-12:00	Operative and Non-Operative Clinics, General Surgery, University, St. Joseph, and Douglas County Hospitals. Eye, Ear, Nose and Throat Surgery—Methodist Hospital.
9:30-12:00	Hospital Conference, Immanuel Hospital.

AFTERNOON

2:00- 5:00	Scientific Sessions: (a) General Surgery, Main Banquet Room, Hotel Paxton.

(b) Eye, Ear, Nose and Throat Surgery, Room 206, Hotel Paxton.

2:00– 5:00 Hospital Conference, Methodist Episcopal Hospital.

EVENING

8:00–10:00 Community Health Meeting, Technical High School.

Friday, March 13

MORNING

9:00–12:00 Cancer and Fracture Clinics, University of Nebraska and St. Joseph's Hospitals.

9:00–12:00 Operative Clinics, Eye, Ear, Nose and Throat Surgery, University Hospitals.

AFTERNOON

2:00– 5:00 Scientific Sessions:
- (a) General Surgery, Main Banquet Room, Paxton.
- (b) Eye, Ear, Nose and Throat Surgery, Room 206, Hotel Paxton.

A cordial invitation to attend this most interesting meeting is extended not only to the Fellows and hospitals of the various states included, but to the entire medical profession at large.

There will be no registration fee.

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting, December 12, 1935

Dr. Floyd Grave, President, in the Chair

*Preliminary Report on the Treatment of Tuberculosis of the Skin by Heat

(Summary)

Elmer M. Rusten, M.D.

A perusal of the literature on the therapy of skin tuberculosis indicates the absence of adequate and satisfactory treatment of this disease. This is mainly due to (1) inability to demonstrate the primary focus of infection; (2) difficulty in treatment of focus, if found; (3) inadequacy of therapeutic procedures in the treatment of skin lesions present; (4) indefinite knowledge of the exact mechanism which produces the various types of lesions.

The treatments used by competent authorities are generally directed to obtain symptomatic relief. The results are generally slow and uncertain. Due to the appearance of tuberculosis cutis on exposed areas with exacerbations during cold weather, and based upon the work of Duncan and Mariette on artificial fever in pulmonary tuberculosis, it occurred to us to apply local heat and general hyperpyrexia for these lesions. It was realized that inhibition of the growth of tubercle bacilli did not mean their destruction. The death point temperature of these organisms is so high that local necrosis would occur if the skin were treated to this level with local heat. General hyperpyrexia at death point temperature of the bacilli is incompatible with life of the host.

The method of treatment consisted of general hyperpyrexia in one case and local heat with infra red lamp in all cases. When local treatment was used, the temperature of the skin was the maximum that could be tolerated by the patient. Occasionally vesiculation occurred. The duration of treatment varied from one-half to four hours or more per day.

Presentation of slides.

Discussion

DR. E. S. PLATOU: Has there been any tendency to necrosis following the treatment of these lesions? Is there any standard for measuring the dosage in this therapy?

DR. WALTER FINK: May I ask if there is any effect on the conjunctive in using heat on the face?

DR. H. B. SWEETSER, JR.: May I ask how long and how high the temperature is raised in the general heat therapy, how long does it last and how is it done?

At the University Hospital it is difficult to get a diathermy outfit so instead of using diathermy they merely wrap the patient in blankets and cover the whole thing up with a rubber sheet, getting a temperature of 106 degrees which they can maintain as long as they want it, simply by wrapping the patient up and letting him develop his own temperature.

DR. A. BEARD: Does a patient treated with an infra red lamp develop a fever as part of his general reaction from the treatment?

DR. H. E. MICHELSON (by invitation): We have all had much interest in the treatment of tuberculosis of the skin. It is of historical value to know that the first effective treatment was along the same lines as Dr. Rusten has talked on tonight. Finsen, years ago, began his light treatment which was, as you know, a water-cooled apparatus. In more recent times, Volk, of Vienna, has had better results with the use of the carbon arc lamp which gives both the heat and the ultra violet rays. Sequiera, of London, and Sir Normal Walker, of Edinburgh, adopted this method and have used the carbon arc lamp to the exclusion of all physical therapy. One might ask why we should treat tuberculosis of the skin when most of the cases are secondary to internal foci. The reason is the same as the eradication of any one of the multiple depots. The more diseased tissue that is rendered healthy the better is the opportunity for the patient to complete recovery. I think Dr. Rusten's simple method is of value and the details must be worked out, such as the length of exposure and optimum temperature, and so forth.

DR. E. RUSTEN: One patient with a sarcoid of Boeck involving the eyelid had a transitory blindness lasting a few hours. There was no permanent effect upon vision. The maximum skin temperature that could be tolerated was between 112 degrees to 114 degrees F. The appliances which were used for heat administration consisted of infra red lamp and diathermy.

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*This paper to be published in the American Review of Tuberculosis under the title, "Preliminary Report on the Treatment of Tuberculosis of the Skin by Heat." Paper presented at the Mississippi Valley Sanitarium Association Conference on Tuberculosis, at Madison, Wis., September 12-14, 1935. Authors: E. M. Rusten, M.D.; G. R. Duncan M.D.; E. S. Mariette, M.D., and D. D. Turnacliff, M.D.

A female patient with minimal fibroid T. B. C., a large pelvic mass, and erythema nodosum thought to be due to tuberculosis was given four (4) diathermy treatments, the skin lesions involulted, chest findings disappeared, and there was a marked diminution of the pelvic mass.

Duncan and Mariette have shown that in vitro the human tubercle bacillus will grow luxuriantly from 96 degrees F. through 100 degrees F., poorly from 100 degrees F. through 104 degrees F., and not at all above this temperature; avian tubercle bacilli will grow luxuriantly through 108 degrees F., and poorly at 110 degrees F. This work suggested to us the possibility of treatment of skin tuberculosis by heat.

EXTRACELLULAR CHOLESTERINOSIS*

Carl W. Laymon, M.D.
(By Invitation)

(Summary)

At the meeting of the Vienna Dermatological Society on October 22, 1930, Kerl presented a patient with a unique dermatosis which was later studied in detail by Urbach, who termed the condition extracellular cholesterinosis and assigned it to the group of cutaneous lipioidoses. The disease is characterized by multiple cutaneous nodules which contain lipoid deposited extracellularly with complete absence of the foam and giant cells which typify xanthoma.

What appears to be an identical case was observed at intervals for several years on the dermatology service at the University of Minnesota Hospital. This was a report of the clinical, histologic and histochemical studies which were made, and a comparison of the only two examples (as far as is known) of extracellular cholesterinosis.

CUTANEOUS LESIONS ASSOCIATED WITH LEUKEMIA

Francis W. Lynch, M.D.
St. Paul, Minn.
(By Invitation)

(Summary)

Cutaneous lesions associated with leukemia may be specific or non-specific. The former have a distinctive clinical appearance and usually a diagnostic microscopic structure. Non-specific eruptions consist of purpura, petechiae, pruritus and papular or papulo-vesicular lesions.

The characteristic eruptions seen in chronic lymphatic and myelogenous leukemia were demonstrated by lantern slides.

Monocytic leukemia has been recognized as a distinct entity in recent years. Acute and chronic forms occur; the eruptions observed in each form were demonstrated. Primary recticulo-endotheliosis is probably the aleukemic phase of monocytic leukemia. No diagnostic cutaneous features have been described. The cutaneous lesions observed in several cases were presented. It is thought that these clinical and microscopic features may make possible ante mortem diagnosis of this condition, particularly in its chronic form.

Discussion

Dr. H. E. Michelson (by invitation): I cannot help, in opening this discussion, to pay a compliment to the younger group of dermatologists in our midst. I have been so intimately associated with them and when I see a summary of their work I am sure that you all know what an intense interest and what great industry they show. Dermatology has passed out of the stage where diagnoses are made entirely on the morphology and, as these papers have shown, it is necessary to have a knowledge of allergy and chemistry and pathology.

The case that Dr. Laymon discussed is extremely rare. It is the second or third one in the world's literature. It demonstrates to us how necessary it is to peruse literature and to compare the rare and undiagnosed cases on our own service to descriptions found in the Ikonagraphia and other publications where rare cases are described. No doubt the lesions are those occurring in a patient with a disturbed fat metabolism. The etiology is entirely obscure.

In the group of cases that Dr. Lynch described we are particularly interested in those of the reticulo-endothelial type because they are entirely new, while lesions due to lymphatic and myelogenous leukemia have been known for a long while.

I am sure that you are all, as I am, justly proud of the work of these men.

Dr. H. B. Sweetser, Jr.: An interesting thing happened at the University Hospital last Friday. We had the regular Friday Clinical Pathological conference for the medical service over there. As an illustration of how the skin group is spreading out, the patient discussed had a rather long continued chronic illness with a question of cirrhosis of the liver and a number of other things. Among other things there was a skin complication. There was a note on the chart which said that this seemed like a liver and spleen affair rather than what the medical service had been looking for. A comment was made that the dermatologists had at last lost their specialty and were becoming physicians again.

In any event, in that particular case the dermatologists gave us the right lead on the patient who was checked up finally as reticuloendotheliosis.

As a curiosity there is also a patient there with myelogenous leukemia. Besides her myelogenous leukemia she is pregnant with twins. When seen a couple of months ago her spleen was way down in the pelvis and had a mass only about the size of a grapefruit for her stomach and all of her intestines. Apparently, the twins are still living. I do not know whether the twins are going to push the spleen out or not but she still has them.

Dr. Carl W. Laymon (by invitation): As to the metabolism of lipoids, it is believed that they are synthesized by the body cells from ingested fat. Although all of the details of the pathogenesis of lipoid disturbances are not known it would appear, at least as far as extracellular cholesterinosis is concerned, that the basis of the disorder is not a primary derangement in the storage of the lipoid, since an abnormality either in the quality or quantity of lipoid in the circulating blood seems to exist first. Urbach found lipoid droplets within the walls of the blood vessels in early skin lesions in his patient before any changes took place in the surrounding tissues. Schüller-Christian disease is in the xanthelasma group, and is characterized by intracellular lipoid deposits in the bones and orbital region.

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*Complete article to be published at a later time.

GROUP ARSENIC TRIOXIDE POISONING

D. D. Turnacliff, M.D.

(Summary)

When the present administration in Washington started into the business of giving as much money away as they could, an opportunity presented itself for the entomologists to see what effect a mixture of five per cent arsenic trioxide bran and molasses spread all over the country would have in ending the grasshopper plague.

Either the preventative measures or the increase in rainfall has eliminated the grasshoppers and in the interval I've had a good opportunity to observe a crew of 75 men exposed to larger doses of arsenic than was even intended for the grasshoppers.

In the usual New Deal haste of doing something even though they didn't know what it was all about, arsenic trioxide, which medicinally we try to keep our daily doses down to less than one grain, was shipped in here in barrels and open cars, dumped out on the floor and shoveled in the mixing process and the men inhaled and swallowed quantities of the dust.

An insurance company became worried about their compensation risk and asked me to look the situation over.

The main points of medical interest noted were:

1. Local caustic action of arsenic on the skin in moist areas, which healed rapidly after sodium thiosulphate packs.

2. Cautery action on nasal membrane with ulcer of septum and through cartilage if continued long enough.

3. Dermatitis in some of the men which went on to sensitization and typical dermatitis exfoliativa, similar to Arsphenamine dermatitis, if exposure was not stopped. Sodium thiosulphate orally or intravenously controlled this condition but those afflicted could not return to the work.

4. Excretion of decidedly increased amount of arsenic in the urine for at least six weeks after the exposure. Sodium thiosulphate stopped the elimination of arsenic. Whether this was by elimination or changing the arsenic to a non-toxic form which was not eliminated our work did not show.

5. Stimulation of hemopoietic system, producing a blood picture similar to a mild polycythemia four to six weeks after exposure. Use of sodium thiosulphate reduced a R. B. C. count from 6,600,000 to 4,000,000 in seven days' time. I didn't believe this the first time it happened so I had Dr. Hal Downey's laboratory check it for me the second time and the same rapid decrease in R. B. C. and hemoglobin repeated itself.

Ever since this experience I've been looking for a case of polycythemia vera just to see if sodium thiosulphate might possibly do the same thing to this similar blood picture. I realized that there was not much logic in expecting similar results but inasmuch as the cause of polycythemia vera is not known I decided to try sodium thiosulphate on a case two months ago. After two grams orally and one gram intravenously daily for six days, the R. B. C. and hemoglobin were increased 10 per cent (within normal limits), so we will have to charge this off as just another experiment that didn't end anywhere except that arsenic in different dosage will stimulate hemopoietic system.

I also used sodium thiosulphate on a case of lymphatic leukemia with the result that there was an actual increase in number of cells, but this was probably due to rapid elimination of arsenic previously administered.

Conclusion-before, during and after exposure or overdosage of arsenic trioxide, sodium thiosulphate relieves symptoms and stops elimination by urine within one week. This is similar to its effect in arsphenamine intolerance.

Ingestion of comparatively large doses of arsenic trioxide does not seem to leave any permanent *subjective* signs in a few cases seen after one year.

Jas. K. Anderson,
Secretary.

MINNESOTA CLINICS

Dr. Burns: Doctors and Friends:

The clinic we have prepared for this evening's study and discussion is composed of a variety of cases to show the difficulties frequently challenging the clinician in the sanatorium. We are also going to present a problem which should stimulate considerable discussion since the adoption of some of the proposals in general practice would mean much to the family physician.

We sincerely hope that our clinics will not be left without thorough discussion, since it is our opinion that a frank exchange of ideas will be beneficial to both those who are holding the clinics and the visitors who discuss. We will present now Doctor E. J. Simons:

NON-TUBERCULOUS AND OTHER INTERESTING CASES

Edwin J. Simons, M. D.

In order to introduce some variety into the program Dr. Burns suggested that both the non-tuberculous cases and those with other pathology superimposed upon tuberculous disease admitted since the last clinic be presented.

This is the case of a male Indian 39 years of age. Ten years ago he had a small papulo-pustule on the sole of the right foot. Gradually it increased in size through the formation of other pustules and crusts. After several months he noticed that he had similar sores on the dorsum of the left foot, and shortly afterward pustules appeared on the outer aspects of both thighs. Then ulcers appeared on both forearms and on the forehead.

He was sent to the University Hospital where the diagnosis of blastomycosis cutis was made, and he was kept on 120 grains of potassium iodide for several weeks. This failed to cause improvement. Treatment with x-ray and radium improved the involved areas, but not till cautery excision and skin grafting were employed did the areas heal entirely. Two years ago the lesion on the right cheek was visible. It grew rapidly as did the one in the gluteal region. Ectropion of the right lower eyelid and contractures of the neck became apparent, yet he refused to remain in the hospital long enough to have these areas treated.

Features of the lesions which are characteristic of blastomycosis are the minute pustules about the border of the infected area. Usually the borders are one to three-eighths of an inch in width and are colored a deep red or reddish purple as seen here. Ormsby describes the lesions as irregular, ragged, rather superficial ulcers having a soft base, a granulating floor and a purulent or sanguineo-purulent discharge which often forms bulky crusts.

Further he states that lesions which have attained the diameter of half an inch or more show the patch to be elevated up to three-eighths of an inch, and the surface covered by irregular papilliform elevations separated by clefts or fissures of varying depth, giving it a verrucous or cauliflower appearance. Portions of the larger areas are covered by more or less bulky and adherent crusts on removal of which the papillary elevations are seen to be larger, lobulated, even subdivided, and bathed with a sero-purulent secretion. This second type of lesion is typified by the gluteal patch on this patient.

The differential diagnosis includes lupus vulgaris and other forms of skin tuberculosis and syphilitic skin lesions. This patient has none of the criteria necessary for the diagnosis of tuberculosis. The film of his chest is clear. For contrast the film of a case of blastomycosis of the lungs, proved by the discovery of blastomyces in the sputum, is being shown. Syphilis was disproved by negative serological studies. Also the diagnosis was proved by finding the blastomyces in the tissues of a biopsy specimen.

Case II.

As the principal case for this clinic tonight, Dr. Burns has chosen a white male, 60 years of age, who presents the following history of his present illness: In 1925, he developed cough, expectoration, loss of weight and hemoptysis. Through consultation with a physician he was told he had pulmonary tuberculosis. He spent one month in a hospital and rested at home for one year. Since then, he has had few or no pulmonary symptoms. However, in 1929, he started to have pains in his legs and feet. These involved the soles of the feet, and when he walked, gave him the sensation that he was stepping on sharp rocks. These pains increased until, in 1933, he was compelled to use a cane. In the spring of 1934, his left knee began to swell, and it has remained swollen but painless since then. Exercise increased the swelling.

On April third, 1935, after four and one-half months in the Sanatorium he left the institution. On November 27th last he was readmitted, complaining of severe pain in his lower abdomen and back, which also radiated down his legs. After leaving the sanatorium he could walk fairly well at first, yet during the last three weeks he could not walk at all. Without losing consciousness his legs would give way beneath him and he would fall down. For some months he has had diplopia which was not improved by glasses. His vision is blurred to such an extent he cannot read. When reaching for an object he knows its distance only when his hand touches it. During the last two weeks he has had no control over his bowels or bladder. He has areas of hyperesthesia and numbness over his legs and body.

Only three significant facts are learned from his past history: In 1904, he had a penile sore, which healed after being cauterized. During 1909, he had chest pains diagnosed by a physician as pleurisy. Ten or twelve years ago he had an oral lesion, diagnosed as syphilis.

Physical examination shows marked deformity of the left chest, with dullness, increased vocal fremitus, and moderately coarse inspiratory rales in the left apex consistent with a diagnosis of pulmonary tuberculosis. Dullness and absence of breath sounds in the left lung base indicate a basal pleurisy. Rales and other pathological findings are demonstrable in the right hemithorax. Neurological examination shows the patient's speech to be slow, as is also his mental reaction. He is emotionally unstable as seen by ease of weeping, and the fact that tears ran down his cheeks through history taking. The tongue deviates to the left. His pupils are fixed, reacting neither to light nor on accommodation. There is a definite horizontal and a slight vertical nystagmus. He counts fingers accurately, and thus does not confirm the history of diplopia. On both finger to finger and finger to nose tests he pass-points. Reflexes of his arms are sluggish but present. Abdominal and cremasteric reflexes are absent. He cannot distinguish sharp from dull sensations over his legs, and when the Oppenheim test is done, he states it is like rubbing hot coals on his legs. Reflexes of the knees are absent. Gordon, Oppenheim and Babinski tests are all negative. He is not always correct in judging the position of the great toes. Tests of his grips and muscle power of legs show muscle activity bilaterally uniform and not greatly impaired. There is no intention tremor of his hands. The Romberg sign is positive.

One other fact is necessary for a true clinical picture: During his first sojourn in the Sanatorium he had diverse pains over various parts of the body, including the extremities and trunk.

In the diagnosis of this case two clinical entities, one pulmonary and the other neurological, are suggested. For the diagnosis of pulmonary tuberculosis there is a past history of pleurisy and the symptoms of tuberculosis, moderately coarse inspiratory rales, and other characteristic signs properly located, positive evidence on x-ray examination, a positive tuberculin test and tubercle bacilli in the sputum. There can be no question of the pulmonary tuberculosis.

From the neurological viewpoint three diseases particularly are suggested, namely: tabes dorsalis or syphilis of the central nervous system, multiple sclerosis and multiple neuritis. Consideration should be given to the combined degeneration seen occasionally in pernicious anemia, and less often in diabetes or other toxic states. A neurological syndrome, secondary to diabetes can be dismissed as a result of repeated negative urinalyses. Postero-lateral sclerosis of pernicious anemia cannot be diagnosed in the face of hemoglobin estimations and red blood cell counts respectively of 80 and 62 per cent, and 4,270,000 and 3,310,000, in both of which series the hemoglobin index is less than 1.0. Furthermore, examination of blood smears shows none of the cell changes found in pernicious anemia.

Thus the neurological complex becomes identified as one of multiple neuritis, tabes dorsalis or multiple sclerosis. If this were a multiple neuritis, it would be most likely to be dependent upon the toxemia of tuberculosis and would fall into the subacute group. Spinal fluid examination and other tests failed to show any other type of toxemia, and at no stage has his tuberculosis exhibited much toxemia. Tuberculosis, undoubtedly, had its inception in the pleurisy of 1909. So well did the organism bear the tuberculous infection that not till 1925 did it become clinically manifest; and not throughout its clinical course have night sweats, rapid pulse, elevated temperature and ease of fatigue, symptoms indicative of toxemia, played an important part. So the toxemia of tuberculosis is not prominent.

In peripheral or multiple neuritis, usually, the legs are involved from the foot upward with muscular weakness, and later the arms are similarly involved. This patient has no such involvement of the arms, and the clinical picture is seven years old. Jeliffe and White state that always there is sciatic pain on flexion of the thigh. This patient does not have such pain. These authors also state that the sphincters are usually not involved except in extremis. The sphincters are involved in this case, and the patient is not in extremis. Osler states that there is rarely inco-ordination. As seen by the finger to nose and finger to finger test, this patient does not co-ordinate well. Further, Osler states that the patient can usually stand well with the eyes closed. On the other hand, the response to the Romberg test in this case is positive. So it can be seen that neither generally nor specifically does this case meet the diagnostic requirements of multiple neuritis.

Most fascinating and interesting is the differentiation in this case of tabes dorsalis from multiple sclerosis. This patient has either positively or suggestively two of the three findings, nystagmus, scanning speech and intention tremor, of Charcot's triad of multiple sclerosis. The bladder is frequently involved, as it is in this case, and, in general, the diplopia, the exacerbations and remissions, the incoordination strongly point to multiple sclerosis. However, the penile sore, the later diagnosis of oral syphilis, the shooting, knife-like pains, the painless swelling of the knees, a Charcot joint possibly, and the ataxia are not easily refuted in the diagnosis of tabes dorsalis. Yet repeated blood Wassermann tests and a spinal fluid test have all been contrary to the diagnosis of syphilis. It was this chain of interesting circumstances which made Doctor Burns feel that the differentiation of these two diseases in this case would prove of interest.

Multiple sclerosis occurs principally between the ages of 20 and 40. Rarely is it seen in patients under 15 or over 50 years of age. Tabes, on the other hand, usually occurs 20 years or more after the initial syphilitic infection and occupies the years from 15 to 70, the ages of greatest incidence being from 40 to 50. In this case the onset was at the age of 53. These ages are not to be considered rigid limits, since many variations occur in both diseases. However, the age in this case at least favors a diagnosis of tabes dorsalis.

This case presents both vertical and horizontal nystagmus and a slow speech, but does not have intention tremor. These three signs constitute Charcot's triad, which, when present, is pathognomonic of multiple sclerosis. This patient's speech is not, however, the slurring, monosyllabic type of true scanning speech, so only nystagmus remains. However, since this triad of signs is found in only 15 per cent of true cases of multiple sclerosis its absence does not militate against such a diagnosis. One neurologist states that in the absence of these three findings multiple sclerosis may be diagnosed from temporal pallor of the optic discs combined with bladder incontinence. Bladder incontinence is present in this case, yet examination of the optic discs failed to demonstrate temporal pallor.

There was no reaction to either light or accommodation of this patient's pupils. A true Argyll-Robertson pupillary sign is present when the pupil responds to accommodation but not to light. This sign is most indicative of central nervous system lues, but it was found four times in 364 cases of multiple sclerosis. Its presence here is, therefore, in favor of syphilis.

Exacerbations and remissions are characteristic of multiple sclerosis and the history in this case decribes such a course. This is particularly true about his ability to walk. On closer questioning it was learned that he was first compelled to use a cane by virtue of both pain in the feet and loss of muscle control. Later he had to use a crutch, but finally he could discard this again for the cane, and at last prior to admittance he could not walk at all. However, these waves of increasing difficulty of locomotion were occasioned first by the arthritis of the left knee, and secondly by a fall and injury of the back just prior to his rehospitalization. So actually there has been a steadily progressive rather than an intermittent increase of symptoms.

Another point which suggests multiple sclerosis is diplopia or double vision. Uhtoff demands double vision as a diagnostic criterion of multiple sclerosis. This patient gives a definite history of double vision, yet upon testing his vision his claims to diplopia disappear.

One of the phases of the picture most convincing for tabes and against disseminated sclerosis is a comparison of the sensory and motor phenomena. In multiple sclerosis usually the symptoms are paresthesias or anesthesias and seldom is hyperesthesia or pain, a prominent symptom. On the other hand, knife-like, shooting pains, gastric crises and hyperesthesia are the usual complaints in tabes. In this case pain was a prominent feature. In sclerosis contractures, spasticity and increased deep reflexes are the rule, whereas in Lues, flaccidity, atrophy and absence of deep reflexes are most frequent. In this case, both the sensory and motor phenomena favor the diagnosis of syphilis.

Thus, from the chancre and oral syphilis, through all the symptoms and signs so far discussed, syphilis appears to be the most tenable diagnosis. Yet in the face of repeatedly negative blood and spinal fluid tests for syphilis, how can this diagnosis be retained? Doctor Kemp, superintendent of the State Asylum at Anoka, during a recent visit, discussed this case. He states that of all forms of syphilis, tabes dorsalis is the one most likely to have all serological tests negative in their indication of Lues. Provocative antisyphilitic treatments are being given in an effort to reverse the serological findings to conform with the clinical diagnosis of tabes dorsalis.

Dr. Burns: We thank Doctor Simons and the visiting doctors who have discussed this paper. The next subject to be considered is one that is of great importance to us all. With the co-operation of the sanatorium doctor and the practicing physician, a great forward step can be made in the care of tuberculosis which will result in material savings to the county and a like increase in the income of the practicing physician.

We have with us this evening Doctor H. E. Hilleboe Executive Secretary of the division of Tuberculosis, Minnesota State Board of Control, who will talk to us about this plan.

REDISTRIBUTION OF COSTS IN THE CARE OF THE TUBERCULOUS

H. E. Hilleboe, M. D.

The physician in private practice concerns himself primarily with the care of the sick, to the end that he may render medical service in the interest of his community, and, at the same time, earn an honest and adequate living for himself. In the minds of most physicians, tuberculosis plays a large part in his service to the community in comparison with the small part it plays in supplying the funds necessary for financial security and stability. That this is true is not to be doubted in the majority of instances.

With the changing order of medical care, particularly as it relates to tuberculosis, there is every reason to believe that this disproportion of services rendered and payment received will be definitely changed, provided the physician in private practice accepts his responsibility and assumes his only logical role in the control of tuberculosis. The doctor must not only continue to diagnose cases as early as possible, and arrange for sanatorium care when indicated, but he must also be the one to give continuous medical supervision to all patients discharged from sanatoria to their own communities.

The physician may reasonably demand that if he is to accept this responsibility for the care of these sick individuals, he must be assured that he will be paid for such medical service. There are no additional funds available at the present time to provide this type of medical care, no matter how valuable it is, or how necessary it may be. Therefore, the solution of the problem we are facing must come from a redistribution of the resources that are now at our command. It is this aspect of the tuberculosis problem which I wish to discuss briefly.

There are certain pertinent statistics which should be reviewed in order that one may have a clearer conception of the distribution of variable factors involved in the types and numbers of patients admitted to and discharged from an institution such as the Minnesota State Sanatorium. This sanatorium has a capacity of 300 beds, exclusive of the Indian building. There were 293 patients in residence January 1, 1934. During 1934 there were 237 admissions and 269 discharges. As the total number of admissions to all the sanatoria in the state was approximately 2,000 in 1934, the Minnesota State Sanatorium admitted about 12 per cent of the total yearly load. Of the total admissions in 1934 to the Minnesota State Sanatorium, 61 per cent (144) were people in the most productive age-group of life, 20-49 years; 62 per cent were males, and 38 per cent females; 44 per

TABLE 1

DISTRIBUTION OF ADULT TYPE TUBERCULOSIS BY ADMISSION, DISCHARGE AND CLASSIFICATION

MINNESOTA STATE SANATORIUM—1934

	200 Admissions		238 Discharges	
N. T. A. Classification	No.	Per Cent	No.	Per Cent
Minimal	17	8.5	43	18.0
Moderately Advanced	35	17.5	38	16.0
Far Advanced	148	74.0	157	66.0

cent (105) were married people, many of them with family responsibilities.

Only 84 per cent (200) of the total admissions to the Minnesota State Sanatorium had adult type pulmonary tuberculosis, distributed as follows, according to the National Tuberculosis Association classification (See table 1), 8.5 per cent minimal, 17.5 per cent moderately advanced, 74 per cent far advanced. This distribution is not greatly dissimilar to that for all the sanatoria of the state combined.

The other 16 per cent of admissions were suspects, extra-pulmonary and other types of tuberculosis. The high proportion of far advanced cases places the Minnesota State Sanatorium at a disadvantage as far as benefits of treatment and duration of stay of patients are concerned. This has a definite bearing on the number of patients discharged with maximum care. It has been shown by various workers that the condition on admission markedly influences the condition on discharge. The Minnesota State Sanatorium has very little choice as to what type of tuberculous patient is to be admitted. Applications are sent in from the physician and accepted as soon as beds become available.

The picture varies slightly when we consider the type and number of patients leaving the Minnesota State Sanatorium in one year; 88 per cent (238) of the 269 patients discharged had adult type pulmonary tuberculosis, distributed as follows (See Table 1): 18 per cent minimal, 16 per cent moderately advanced, and 66 per cent far advanced.

There were two patients with minimal lesions who left against medical advice in less than a month after admission, and 20 far-advanced patients who left before their first month of residence was terminated, in 10 of whom death was the cause of discharge.

Some interesting facts are observed when we consider the type of patient discharged after more than 30 days residence (Table 2): 80 per cent of the 41 minimal cases had received maximum care, 50 per cent of the 38 moderately advanced, and only 13 per cent of the 137 far advanced. Of the 137 far advanced cases, 29 (21 per cent) were discharged against medical advice; 18 of these 29 had positive sputum on discharge.

Of this group of patients in residence at least 30 days, death was the reason for discharge in 23 per cent of the cases. Only 42 per cent of the 167 tuberculous patients discharged alive had remained long enough to permit the medical staff to give maximum care before discharge. We will not go into the question as to what should be done with these patients who leave against medical advice, as that problem involves the enforcement of State Board of Health regulations, and, consequently, separate consideration.

The arrest of disease resulting from maximum care is too costly to allow the good effects obtained to be lost in the years following discharge because of lack of medical supervision. Yet that is exactly what is happening with many of the patients discharged each year from the sanatorium. It is during the first five years after discharge that the greatest mortality is experienced by discharged patients. The most recent figures based on studies from 1913 to 1926 by Knight and Dublin among insurance field and office workers show that minimal cases do not experience mortality rates much different from those of people of similar age and sex in the population from which these people are drawn (See Table 3). However, moderately advanced cases have nearly 5.5 times the risk of dying in the years following discharge, and the far advanced cases almost 17 times the risk of dying when compared to groups of people of similar age and sex in the population from which these people are drawn.

TABLE 3

RATIO OF ACTUAL TO EXPECTED DEATHS BY AVERAGE LENGTH OF STAY AND CLASSIFICATION OF DISEASE

Mount McGregor Sanatorium, New York
(Knight and Dublin)

N. T. A. Classification	Average Stay (months)	Ratio Actual to Expected Deaths
Minimal	6	1.29 : 1
Moderately Advanced	10	5.49 : 1
Far Advanced	23	16.98 : 1

It is imperative that discharged patients be supervised during the immediate years following discharge so that as few as possible break down and again require sanatorium care. In providing medical care for the discharged patient, no better choice can be made than qualified physicians in the local community. The cost of this supervision would be only a fraction of the amount paid by the county and state for the care of discharged patients who break down and are readmited to sanatoria repeatedly because of inadequate medical follow-up.

Of the total admissions to the Minnesota Sanatorium in 1934, 12 per cent (29) were second admissions, not counting previous admissions to other sanatoria; 5 per cent (12) were third admissions and 4 per cent (9) were fourth admissions or more. If maximum care is administered at the sanatorium,

TABLE 2

DISTRIBUTION OF DISCHARGED PATIENTS AFTER 30 DAYS' STAY, BY CLASSIFICAION AND CAUSE OF DISCHARGE

MINNESOTA STATE SANATORIUM—1934

N. T. A. Classification	Total	MAXIMUM CARE No.	MAXIMUM CARE Per Cent	AGAINST ADVICE No.	AGAINST ADVICE Per Cent	DEATHS No.	DEATHS Per Cent
Minimal	41	33	80.0	1	2.5	1	2.5
Moderately Advanced	38	19	50.0	5	13.0*	1	2.6
Far Advanced	137	18	13.0	29	21.0**	47	34.0

* 1 had positive sputum.
** 18 had positive sputum.

adequate follow-up by the family physician can become the most important factor in decreasing post-sanatorium break-down and in reducing the number of readmissions.

Of 167 patients discharged alive during 1934 from the Minnesota State Sanatorium, 24 per cent (40) were on pneumothorax treatment. In 55 per cent of the persons on this treatment, the collapse was effective. It is a well known fact that pneumothorax, to be of maximum benefit, must be maintained uninterruptedly over a period of three to five years or longer in most cases.

Here again the physician in private practice is the most logical person to continue this type of treatment after the patient leaves the sanatorium and returns to his community. The physician must be qualified to carry on this procedure as well as interested in diligent follow-up. It is only reasonable that provisions be made before discharge of the patient, for the payment for these treatments by the county authorities who have been authorizing sanatorium care. From past experience at the Minnesota State Sanatorium, most county officials are only too glad to pay some local physician $5.00 per treatment once or twice a month, plus the cost of an occasional x-ray of the lungs, rather than $40.00 to $50.00 per month for sanatorium care, which is otherwise necessary.

It is to be noted that actually less money is being spent with the same end-results in the control of the disease, plus some remuneration for the family physician, plus a saving of $5.00 per week to the state, which the state law provides through the Division of Tuberculosis of the State Board of Control for each free patient in a county sanatorium. At the Minnesota State Sanatorium the appropriation is made directly and not at the rate of $5.00 per patient per week, but the saving is the same.

The extent to which this method of follow-up may be instituted depends upon two factors: first, upon the number of such patients who are diagnosed by physicians and sent in with early tuberculous pulmonary lesions for which it is possible to establish pneumothorax treatment; second, upon the number of physicians who will interest and prepare themselves for this type of follow-up work. The sanatorium will not only help in arranging the financial details, but will also offer consultation service to the family physician for medical problems that arise in follow-up work.

There is still another group of patients in residence in the sanatorium, however, who might be cared for elsewhere if adequate medical supervision and shelter were available. I refer to those patients who have been in a sanatorium for at least a year, who have come to have a consistently negative sputum, whose lesions are not amenable to special forms of treatment, and who are occupying an expensively maintained bed in a sanatorium simply because there is no other place provided for domiciliary care.

From a public health standpoint such patients are not considered contagious; from a socio-economic standpoint complete relief must be provided; from a sanatorium administration standpoint, a bed is being occupied without any objective being gained, such as the isolation of an infectious person, or the arrest of the disease in a remedial case. From all three points of view it is unprofitable and unproductive of results to have such persons in a first class sanatorium for any period of time longer than is necessary to determine the status of each case.

Among 691 patients resident in six of our sanatoria, some large and some small, there were 55 or 8 per cent of the patients who could be cared for at county poor farms or local hospitals. These cases were so designated by the superintendents in charge of these institutions. The average length of residence of this group of patients up to November 1, 1935, was 38.3 months. No records are available to show how long these patients will continue to be in residence.

Presumably this group of chronic type of cases will need to be hospitalized in tuberculosis sanatoria until death removes the necessity for care. That is certain, unless some other plan can be devised to shift the responsibility. I would like to present such a plan for thoughtful consideration.

By allotting some of the space in county poor farms and local hospitals for these chronic, negative sputum, tuberculous individuals, a whole cycle of inter-related benefits would be set in motion. Adequate domiciliary care can be had for one-half to one-quarter the cost of complete sanatorium care. The per diem gross daily cost of the Ramsey County Home in 1933 was $.65 per day. The daily cost of care in many local and county hospitals varies from $1.00 to $1.50 per day, including medical care. The per diem cost of maintaining a patient in a good sanatorium is approximately $2.25 per day.

If we were to remove 20 such patients who are now in residence at the Minnesota State Sanatorium, to local hospitals and county poor farms, and maintain them for a period of five years, what benefits could be expected? For each patient thus cared for, instead of spending $2.25 per day per person for five years, only $1.50 would be expended (allowance being made in this figure to include $.25 per day for medical care) leaving $.75 per day per patient for five years to be used for providing sanatorium care for additional tuberculous individuals, particularly those positive sputum cases spreading infection and disease among their family members, as well as cases in less advanced stages of the disease who might become arrested with proper sanatorium care.

Instead of spending $82,125.00 for sanatorium care of 20 domiciliary cases over a conservatively estimated period of five years, that same amount of money could be used to care for 20 patients for five years in county poor farms and hospitals at a cost of approximately $54,750.00, leaving $27,375.00 which would provide care for 33 additional tuberculous persons for one year each, without any increase in total cost. Thus, 53 tuberculous individuals would be under control, whereas only 20 were before. This redistribution of our present resources is the solution we have to offer for the problem of providing adequate medical and socio-economic follow-up for certain groups of discharged patients.

The results are more far-reaching than the comparative figures would indicate, even though we are dealing with only 8 per cent of our sanatoria population. At least one-half of the funds expended for the care of the tuberculous will be spent in the local community instead of some far off place where the institution is located. The physician practicing in the community to which the patient is returned will have the unusual opportunity of giving individual care and treatment to his patient with tuberculosis and worthwhile public health service to his community, and at the same time he will be receiving substantial payment for his otherwise charitable services. The county funds will be used to greatest advantage in the necessary care of the tuberculous. Most important of all, additional dangerous and infective cases of tuberculosis will be removed from the family in which the disease is being spread. This one factor alone, by decreasing the number of exposed persons and new cases, would make the proposition pay dividends, forgetting for a moment the other benefits to be derived. Accordingly, the cost of caring for the tuberculous will definitely be reduced when there are less cases to be cared for.

The sanatorium will become a more effective weapon in the control of disease when redistribution and follow-up of cases changes the type of tuberculous individuals entering and remaining in residence. Instead of admitting 74 per cent far advanced cases, we will strive for a reversal to 74 per cent minimal cases on admission. More cases in the infective stage will be isolated and more beds will be available for patients who need and will benefit from special sanatorium treatment and care. Maximum sanatorium care rendered to the greatest number of persons in the shortest possible time would be the objective gained.

It is not unreasonable to suppose that the end results of the interplay of the combined factors mentioned above, should have an appreciable effect on the mortality rate in tuberculosis, which, after all, is the real criterion upon which to base any conclusions as to results.

The Minnesota State Board of Control, through its tuberculosis division, is vitally concerned in the spending of approximately three-quarters of a million dollars every biennium for the care of the tuberculous in sanatoria throughout the state, to the end that contagious cases will be isolated, that active cases will become inactive and arrested by special treatments, and that the public health will be improved. As W. H. Frost has stated, we must make as our definite objective the hastening of eradication of the disease rather than merely maintaining partial control. We believe that proper follow-up of different groups of discharged patients, which can be made possible under present conditions only by the concerted efforts of physicians in private practice, working hand in hand with sanatoria medical staffs, is the key to the solution of one of the major problems in tuberculosis today.

Summary

1. There are 20 and more such patients in residence at the Minnesota State Sanatorium who could be cared for elsewhere at less expense if adequate medical follow-up could be guaranteed before discharge.

2. By a redistribution of funds, the counties and state paying for the necessary care of the tuberculous' would get much more value for their money, and benefit in the future from money being spent wisely in the present.

3. Many more tuberculous individuals and their families would be brought under control, because of the isolation, care and treatment of infectious cases made possible by additional available sanatorium beds at no increase in cost.

4. The income of the family physician will be increased in direct proportion to the extent to which he interests himself and takes part in the medical follow-up of patients discharged to his community.

Dr. Burns: The next paper on our program will be given by Doctor V. O. Wilson, who has arranged a number of patients to illustrate the groups brought out in Doctor Hilleboe's paper as satisfactory subjects who, under proper conditions, might be discharged to home care.

THE EARLY DISCHARGE OF SANATORIUM PATIENTS TO LOCAL MEDICAL SUPERVISION

Viktor O. Wilson, M.D.

To demonstrate the practical application of the early discharge of sanatoria tuberculosis-patients to the medical supervision of the family physician the following cases are presented. These cases fall naturally into four clinical groups, as follows: (1) minimal or moderately advanced pulmonary tuberculosis with clearing lesions and negative sputum, in which no special therapeutic measures are necessary, (2) unilateral pulmonary tuberculosis in which the disease is controlled and the sputum rendered negative by pneumothorax collapse therapy, (3) far advanced pulmonary tuberculosis controlled by surgical treatment, (4) domiciliary tuberculous patients. One case representing each group is presented.

Case I. That of a 52-year-old, married, white woman who has a family of four children, was admitted to the Minnesota State Sanatorium December 2, 1934. She had a six year history of illness characterized by ease of fatigue, cough, loss of weight and pulmonary hemorrhage. On admission she weighed 87 pounds, her Mantoux test was positive, her sputum was negative for tubercle bacilli, and the blood sedimentation test presented a vertical curve (method of Cutler).

X-ray examination of the chest (Fig. I) was interpreted as showing bilateral moderately advanced pulmonary tuberculosis. Treatment in the sanatorium has been bed-rest, dietetic and symptomatic, medicinal therapy. At the present time, after one year's hospitalization, she weighs 107 pounds, a gain of 20 pounds. She has scant cough and expectoration, and all sputum examinations are negative. She is a partially ambulant patient who feels well, and, roentgenologically, there has been marked resolution of her disease (Fig. II).

This patient is not ready to be discharged to do as she pleases. Her return home undoubtedly entails an active part in the housekeeping for the family. If that were done, she would suffer an exacerbation of her disease requiring longer sanatorium care than this first time. Yet she has negative sputum, is symptomatically well, and no longer requires hospitalization. She does require continued partial rest therapy under medical supervision and freedom from responsibilities to insure her continued convalescence. If the proper arrangements can be made with her family doctor and the county authorities to provide these necessities, she can be returned to her home.

This case is that of a 32-year-old, single, white woman whose history of tuberculosis began seven and one-half years ago. Four years of sanatorium care rendered her sputum negative, and she returned home for one year. Then a reactivation of her disease in 1933 was accompanied by the return of positive sputum, and she was admitted to the Minnesota State Sanatorium. At that time she weighed 113 pounds. Her Mantoux test was positive, and sputum was positive for tubercle bacilli. She was toxic and felt that her case was hopeless. Thoracic roentgenograms show the heart and mediastinal contents moved into the left hemithorax, the details of which are blotted out by a dense shadow. The diagnosis was massive collapse of the left lung due to tuberculosis (Fig. III). Pneumothorax collapse therapy was instituted August 9, 1933. At the present time she weighs 124 pounds. Her sputum has been consistently negative since January, 1934. She is now symptom free and partially ambulant.

This woman's disease has been controlled by pneumothorax therapy (Fig. IV). Her sputum tests are negative and she no longer requires isolation in a sanatorium. She does require monthly pneumothorax refills and the safety of a sheltered environment over a long period of time. Surely, the county authorities would be willing to pay the local physician the cost of monthly refills and an occasional follow-up x-ray film, instead of the sanatorium maintenance fee. Her bed could then be released for a sick patient with positive sputum, such as she was when admitted two years ago.

This third case is that of a 24-year-old, single, white woman. She was admited to the sanatorium February 4, 1930. Following influenza in March, 1929, she remained sick, and, in January, 1930, her case was identified as pulmonary tuberculosis. She weighed 104 pounds, and had markedly positive sputum. She

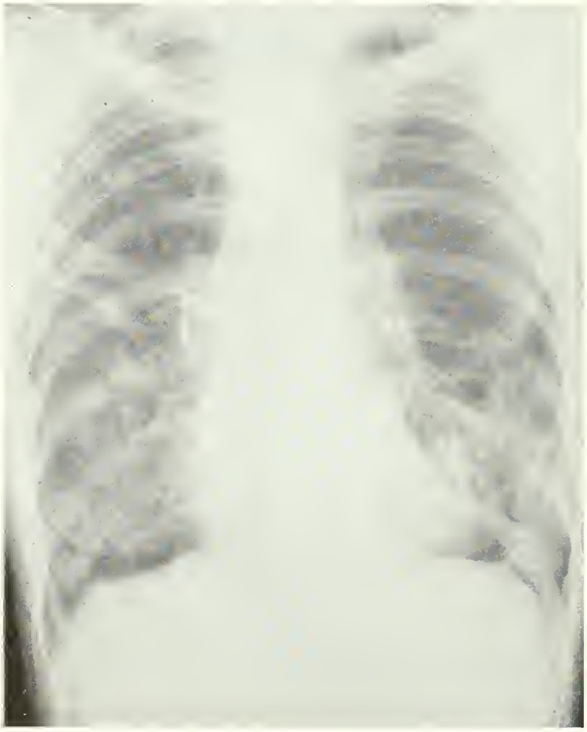

Figure I, Case I—X-ray of chest 12-4-34 showing bilateral moderately advanced tuberculosis.

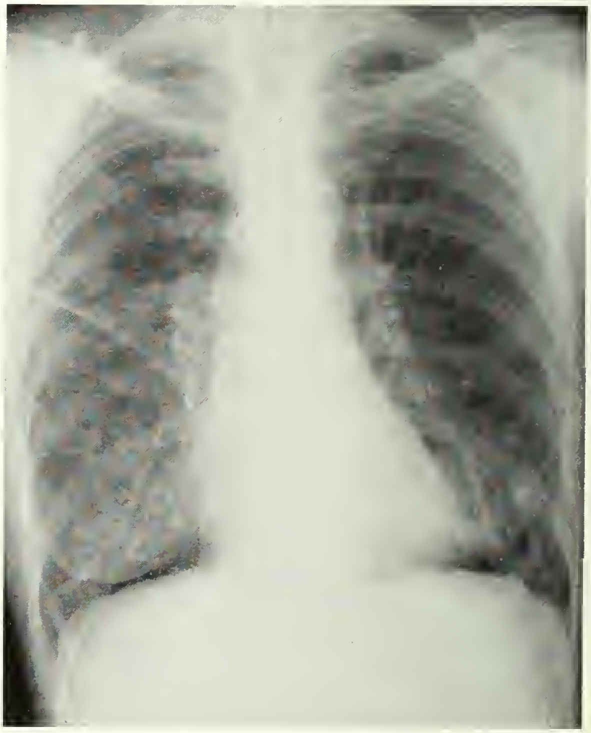

Figure II, Case I—X-ray of chest 12-16-35 showing marked clearing of disease one year after admission.

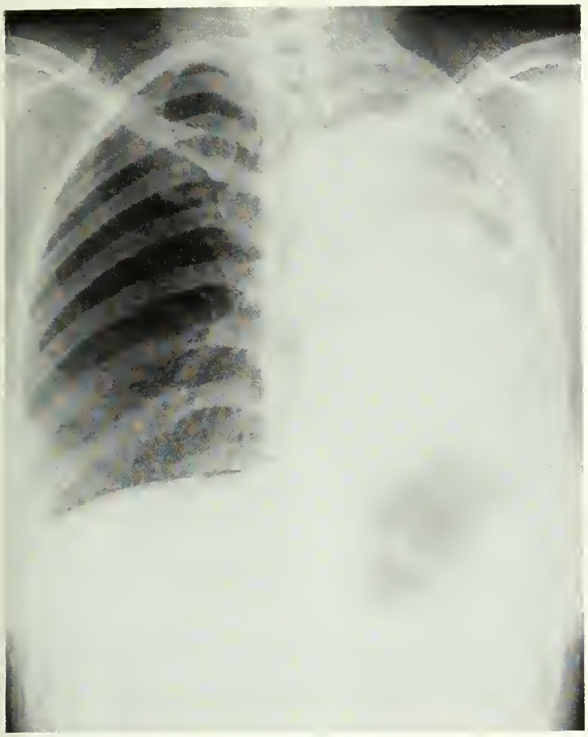

Figure III, Case II—X-ray of chest 7-31-33 showing dense opacity of left lung secondary to tuberculosis.

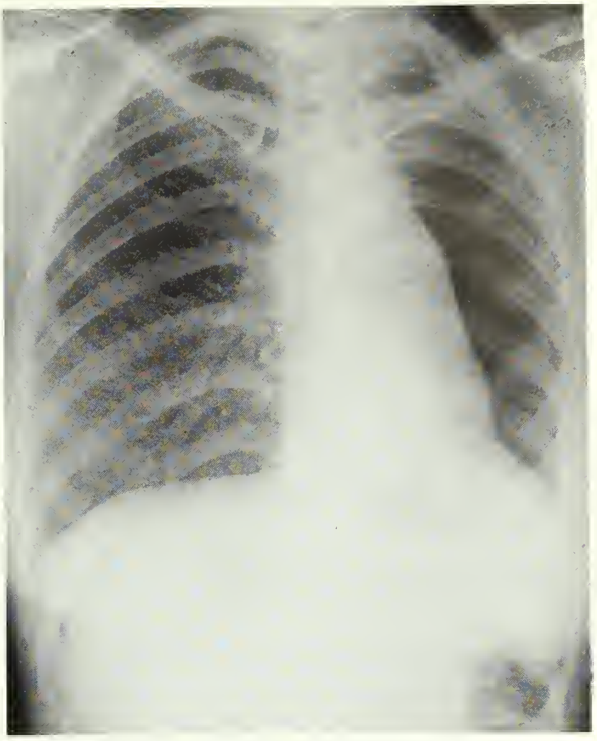

Figure IV, Case II—X-ray of chest 11-14-35 showing diseased left lung collapsed by pneumothorax.

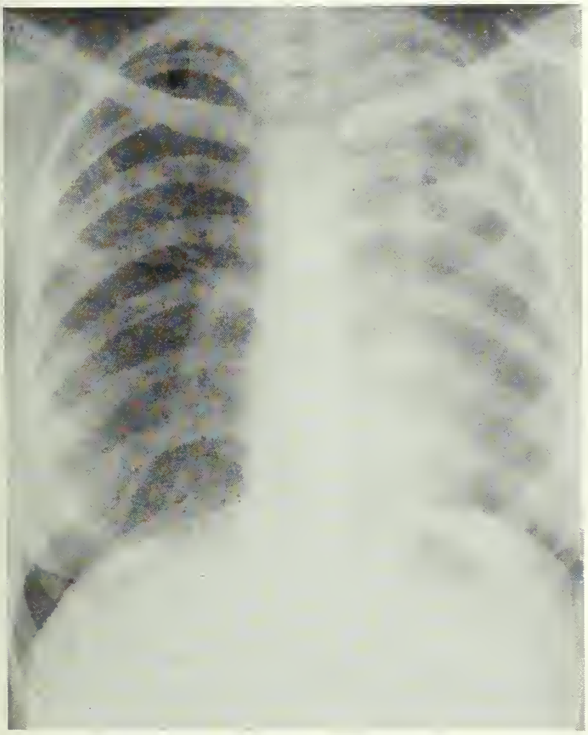

Figure V, Case III—X-ray of chest 10-18-30 showing bilateral pulmonary tuberculosis with multiple cavitation of the left lung.

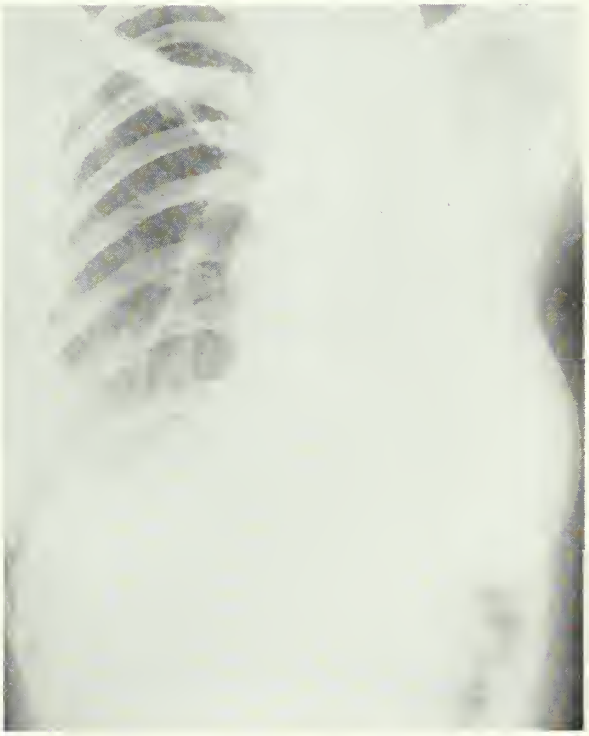

Figure VI, Case III—X-ray of chest 10-2-35 showing thoracoplastic collapse of the left hemithorax.

was toxic, as shown by elevated temperature, rapid pulse, and loss of weight. Her chest x-ray plate on admission showed findings characteristic of bilateral pulmonary tuberculosis. There was extensive disease with multiple cavitation of the left lung (See Fig. V). Attempts to induce pneumothorax of the left lung were unsuccessful, and in view of bilateral disease, she was treated by strict bed-rest and partial collapse of the left lung through phrenic exeresis. There was persistence of the positive sputum associated with cavitation in the left lung. In 1933, the condition of the right lung permitted left extrapleural thoracoplasty. This was performed in two stages (See Fig. VI). At the present time this patient weighs 125 pounds, 21 pounds more than on admission. Her sputum has been negative since the thoracoplastic operation, and the blood sedimentation rate presents a normal horizontal line. She looks fine, and is symptomatically well except for slight cough and expectoration.

Through almost six years of treatment this patient has improved to the point where she no longer requires sanatorium care. She does require medical supervision of a partial rest regime. These things can be supplied at home with less expense to the county, but, unless she goes home with these necessities adequately provided, it would be better to maintain her in the sanatorium for the present.

This last case is that of a 48-year-old, single, white woman, and illustrates the domiciliary type of tuberculous patient. Her history dates back to 1921, when she spent two years in the Manitoba Sanatorium at Ninette. Again, in 1925, she experienced an exacerbation of her disease. Tubercle bacilli were found in her sputum and she returned to Ninette. There she remained until transferred to the Minnesota State Sanatorium in October, 1927. On admission, she weighed 114 pounds, and was symptomatically well, except for cough and expectoration. Her sputum was negative and chest x-ray films were interpreted as characteristic of bilateral pulmonary tuberculosis infiltration to the second rib, right; and the third rib, left (See Fig. VII). During her eight years residence in this sanatorium, she has been an ambulant domiciliary case. Her weight has been stationary, her present weight is 116 pounds. Her sputum tests are consistently negative. Present chest x-ray plates show little change over those at the time of admission. She is now 48 years old, untrained, and her long institution residence has rendered her unadaptable to other than an institutional environment. Further, she is incapacitated by tuberculosis and progressive paralysis agitans. This is truly a domiciliary county-home case, requiring only a sheltered environment and medical supervision, not only to insure regular sputum follow-up to pick up a return to a contagious state before harm has been done, but also against reactivation of her tuberculosis.

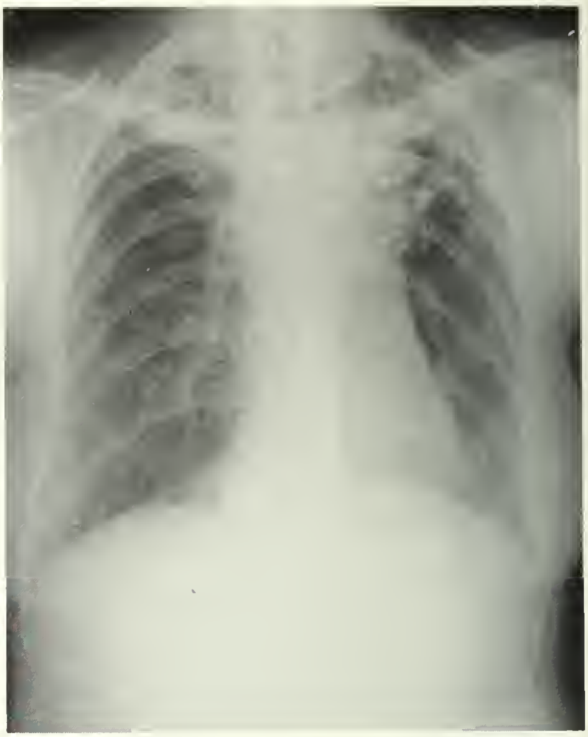

Figure VII, Case IV—Chest x-ray showing bilateral pulmonary tuberculosis.

Summary

I have presented four cases which exemplify the types of patients Doctor Hilleboe has referred to in his paper. These cases all have definitely negative sputum, and no public health problem is involved. While they have not entirely recovered, and will require medical supervision over a long period of time, they have improved to a point where they do not require isolation in a sanatorium.

Up to the present time, we, as sanatorium physicians, have been obliged to continue supervision of these cases in the sanatorium because no arrangements have been possible, except in a few cases, for adequate follow-up care in their local community. The family physician upon diagnosing tuberculosis has too often hopelessly thrown up his hands and sent the case off to the sanatorium. The county officials have been unwilling to authorize adequate local care.

Doctors Burns and Hilleboe, seeing this problem from an administrative viewpoint, have suggested a plan whereby a redistribution of patients and funds will not only provide adequate medical care at less expense for these cases, but will benefit the family physician and local community and further the control of tuberculosis.

The county authorities, with a better understanding of the problem, are rapidly becoming interested and are showing a willingness to participate in the plan.

A PLAN FOR THE HOME CARE OF TUBERCULOSIS PATIENTS

H. A. Burns, M. D.

Superintendent Minnesota State Sanatorium

In this clinic, I propose to demonstrate that the responsibility for the tuberculosis problem is limited to the family doctor and the health officer. As a part of the health officer's equipment, the tax-supported sanatorium is a necessary adjunct. Increasing the number of agencies has meant added expense which is not reflected through added efficiency in the control methods employed. Money that should be deflected into channels giving the health department necessary funds to carry out its part in a control program, funds that should add enough to the family doctor's income to make it possible for him to train and equip himself to carry on his part in the work, such funds, more than ample, are now being spent ineffectively but generously by the interested and well-wishing citizens of the state.

The Minnesota State Sanatorium plan has been referred to in previous publications.* Just how satisfactorily is that plan working, how extensive is its present application, what are the possibilities of its further extension to the profession? The medical staff of the State Sanatorium considers as one of its first duties the building up of confidence in the family doctor who is responsible for the diagnosis of and admission to the sanatorium of most of the cases coming in for treatment. While much talking may occur among patients, we feel that we have not fulfilled our duty if, for some reason, the patient chooses some other medical counsel than the family doctor following his return home. We realize that this will sometimes occur, but we want the doctors in our area to become more and more interested in our common problem and as they show such interest, our success in returning their cases will become more evident. This custom, once it becomes established, will do much to elevate the standing of the doctor in the community. If we are not willing to build up confidence in our doctors who are depending upon us for assistance, we cannot go far in winning public esteem for ourselves. We do have a common problem, the end result of which cannot be realized except we win familial appreciation and public esteem through a friendly, co-ordinated, medical service.

In carrying out our program, we arrange with the county authorities as soon as a patient is prepared to be transferred to home care. The county authorities, in turn, arrange with the family doctor concerning the cost of financing the patient after his discharge from the sanatorium. The sanatorium continues to be interested in the patient. The family doctor receives the patient with the understanding that the monthly examination will be a thorough review of the case; physical signs, evidence of toxemia, sputum examinations and occasional x-rays will all become a routine of his practice and at times will also be reviewed by sanatorium personnel. Sputum specimens will be sent to the State Board of Health Laboratories each month. If the patient is on collapse therapy, refills will be necessary at intervals of from two to four weeks, and x-rays indicated every three or four months. Fluoroscopic examinations should be made frequently. X-ray films taken are referred to the State Sanatorium for reading and comparison.

The sanatorium also serves in the capacity of consultant, aiding in the reading of x-ray films, standardizing equipment, distribution of tuberculin for the Mantoux test, and in any other ways which will promote the doctor's success in his tuberculosis practice. The epidemiologist will confer frequently with the doctor concerning his cases. Home care will be authorized for a 6 to 12 month period, at the end of which the sanatorium will advise concerning the need for continued home care. To make the doctor's supervision uniform and highly efficient, a scale of fees has been tentatively arranged as follows:

Monthly examination	$3.00
Pneumothorax Refill	5.00
X-ray plate of chest	8.00

If a case which has been returned to the family doctor shows signs of reactivation on physical examination, signs of toxemia, or the reappearance of tubercle bacilli in the sputum, such a patient should be immediately isolated and plans for his return to the sanatorium completed. The family doctor, patient, and county officials should all direct their efforts to the end that the patient is isolated in the sanatorium with the least possible delay.

The tax-supported sanatorium is a public health agency, and, as such, only cases in need of institutional care should be admitted. The local hospital should be utilized for purposes of diagnosis and classification, if possible, so that the facilities of the sanatorium can be limited to the care of known tuberculosis cases.

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*H. A. Burns: The Program of the Minnesota State Sanatorium, Journal-Lancet, February 15, 1933.

H. A. Burns and H. E. Hilleboe: Minnesota State Sanatorium Plan of Tuberculosis Control, Journal-Lancet, July 1, 1934.

H. A. Burns and H. Mark: Minnesota Plan for Control of Tuberculosis, Journal-Lancet, December 15, 1934.

In a preceding paper, Dr. H. E. Hilleboe showed the importance of such a program, and Dr. V. O. Wilson further emphasized these proposals by showing sample cases chosen from our patient population. I shall use the cases referred to by Dr. Wilson to demonstrate further the efficiency of a plan that would return the tuberculosis problem to the site of its discovery—the office of the family doctor.

With a patient load of 280 white patients, we have 60 at this time who have shown negative sputum over a period of six months or more, and whose other findings are all consistent with a healing or healed lesion. These plates represent patients with old chronic disease who have been consistently negative. They are representative of the 60 cases who could be given adequate care under medical supervision at home. Under proper conditions previously arranged for by both the family doctor and the county authorities, the sanatorium could easily discharge these patients, adding considerable to the doctors' practice, and to the community income, at the same time reducing the cost of care by one-half. With efficient liaison, these patients can be returned to their homes from six months to three years sooner than is now possible. Of the 60 cases referred to, all but 13 were sent in by their family doctor and should again be added to his practice. (See Figures I and II, Dr. Wilson's paper.)

His next plates are representative of a group on collapse therapy who might well be home under the same conditions as those whose cases have healed with negative sputum without surgical intervention. Such cases require pneumothorax refills, as well as medical supervision, over a considerable period of time after the tubercle bacilli leave the sputum. There are now 27 such cases in the sanatorium who are or will within six weeks be ready for transfer if satisfactory home care can be arranged. Twenty-two of these cases would, under ordinary conditions return to their family doctor. (See Figures III and IV, Dr. Wilson's paper.)

At this time we have 60 patients on collapse therapy who have been transferred from the sanatorium to home-care. In this group there are 18 going to their family doctors, 15 to tuberculosis-specialists, and the remainder are attending clinics or going to sanatoria for refills. Those who are going to their doctors or to specialists are being paid for by the counties, as are some of the others concerning whom we have no definite information. Four of these 60 patients have been on home treatment under six months while the remaining 56 have been away from the sanatorium for a variable period up to six years. These patients continue to receive pneumothorax refills, and if they had all employed private physicians, $12,400 would have been spent for pneumothorax refills alone. Because of the fact that only 18 were cared for by the local doctor and 15 by tuberculosis-specialists, there were but $5,920 directly paid by the counties to the physicians and tuberculosis-specialists for pneumothorax refills, out of a possible $12,400. These figures were arrived at depending on the number of refills given each of the patients individually since leaving the sanatorium at the rate of $5.00 per refill. We feel that all cases should be returned to the physician of their choice and that sanatoria and free clinics should not be used for this purpose.

There are 20 patients who have left the sanatorium following phrenicectomy or thoracoplasty who have been discharged as consistently negative sputum cases. These patients should also be receiving medical follow-up for sufficient length of time to protect their associates against the possibilities of their reactivating or the recurrence of tubercle bacilli in their sputum.

According to our records we have 87 patients who could, under favorable conditions, be transferred to home care. Many of these will go as soon as we can make the necessary arrangements for them. Many more will go as rapidly as organized medicine gets behind the family doctor and lends its aid in the rehabilitation of this element of his practice.

During 1933, we had in the unorganized area 244 deaths of whom 59 died in the State Sanatorium. A few died in other institutions outside of the State Sanatorium, while the remainder died at home. These cases we expect the doctor to get into the sanatorium in order to protect others in the family. During the year there were 414 positive sputum cases of whom 179 were isolated, leaving 235 as carriers in their homes and communities. These positive sputum cases must be isolated as soon as identified. The doctor in getting the clinical, non-contagious cases back into his practice must see to it that the carrier cases are isolated in the sanatorium without delay. This shift in our tuberculosis problem is necessary. We must vacate the beds now occupied by negative sputum cases to make room for the positive sputum cases at large in the community.

The Annual Report of the Division of Tuberculosis, Minnesota State Board of Control, January 1, 1934 to December 30, 1934, shows that 104 cases were admitted to all the sanatoria as first infection types of tuberculosis. During the year, 1,051 patients were discharged to their homes throughout the state. Due largely to our present lack of properly organized home-care by the family doctor, many of these leave with positive sputum, while others reactivate through lack of supervision and later seek readmission. Of such cases 353 previously so discharged were returned to sanatoria during 1934. Strange as it may seem, 133 patients with tubercle bacilli in their sputum were discharged without plans having been made for their isolation in the home. Out of 252 cases on collapse therapy discharged from sanatoria, plans for refills and medical supervision following their discharge have not been reported upon. This data in the Annual Report is reviewed to emphasize again the need for medical supervision in these cases by the family doctor in order to prevent needless expense to the counties, to minimize the need for continued readmissions, to use the institution for the purpose of isolating the contagious case, and to return the non-contagious case to the doctor for such care as may be required. Practically all of the 1,051 cases discharged from sanatoria were originally sent to the sanatoria through the efforts of, and following the initial diagnosis by the local doctor.

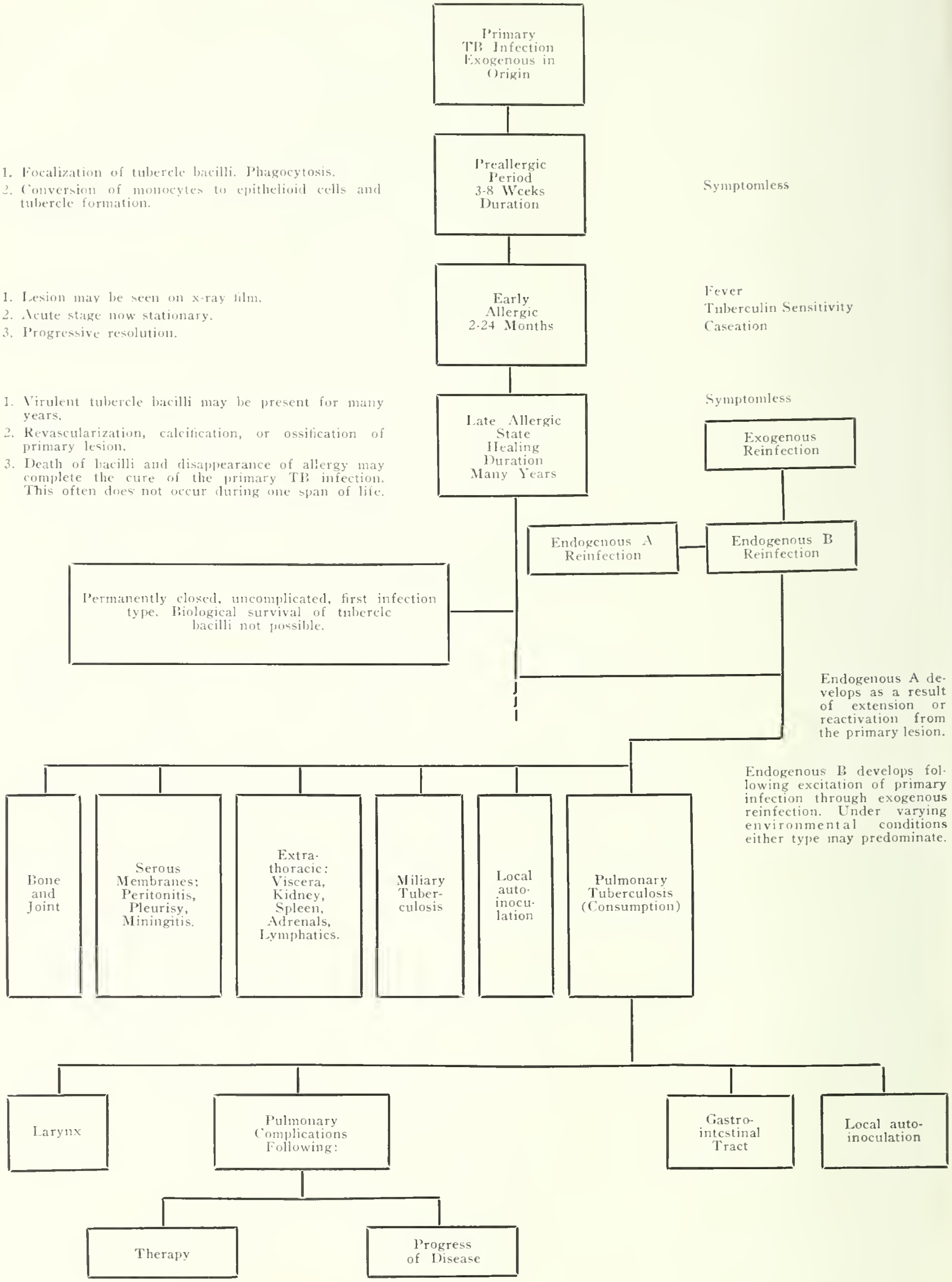
If the practice carried out with us could be made state-wide and the discharges from institutions all made the responsibility of the local doctors in the community, it is interesting to note that under these conditions the cases of pneumothorax receiving one refill per month at $5.00 per refill, over a period of two years time, would amount to $30,240. The 104 cases of first infection type tuberculosis receiving three examinations a year at $5.00 per examination would amount to $1,560. The medical supervision of the discharged group who require only a monthly examination and supervision at $3.00 per examination would amount to $37,530. The total amount of money from the discharged cases during a single year would be approximately $69,330. While this amount would be spent for care over a period up to two years, the number of patients discharged from sanatoria would be adding to the doctors' practice continuously. A conservative estimate of the amount added to the practice of the general practitioners by the care of tuberculosis patients transferred to home care is approximately $200,000 per year if he actively interests himself in participating with the health agencies and county officials in carrying out a supervised tuberculosis program of this nature.

If we now had a set-up in Minnesota whereby these 1,051 cases were to return to their various homes for further treatment and supervision by the family doctor, and this number of discharges were a yearly occurrence, it is evident that the local physician would be required to interest himself in the entire tuberculosis problem. It would be necessary for him to study the technic of the Mantoux test and positive reactions thereto in relation to the primary tuberculosis infection. It is necessary that he understand the close relationship between primary and secondary tuberculous infection and the danger of the reinfection type through association. A logical and constant observation of the discharged patient for a period of time following his discharge from the sanatorium in order to prevent the reinfection type in his family contacts through the reactivation of his tuberculosis must be maintained. In order to simplify the information available on this subject to date, the following diagram has been drawn. This classification of tuberculosis is a modification of that developed by the Lymanhurst group. (See Am. Rev. of Tb., 3588, 1934). It is presented here to show more graphically the element of this medical problem which fits into the doctor's practice.

If from 15 per cent to 25 per cent of those in young adult life show positive skin reactions, it becomes evident that there are many young people passing through the early allergic stage of their tuberculosis unobserved. To avoid the serious reinfection types of the disease, a carefully routinized medical supervision of the early allergic stage should be carried out.

I would like to bring to your attention two cases of primary tuberculosis infection during the early allergic stage. Of these two cases, one shows an extensive pneumonic infiltration in a baby under two years of age, who has developed this infiltration and is now recovering from it without ever having demonstrated either objective or subjective symptoms. The second is a child aged 12 who shows a first infection type of smaller extent. This case also has cleared up since the first plate, showing a primary tubercle in the parenchyma and calcified glands in the mediastinum. I would like to re-emphasize the importance of routinizing this type of tuberculosis care. While it does not appear to be necessary to hospitalize such cases under ordinary conditions, it no doubt would prevent the

DIAGRAMMATIC SCHEME SHOWING PATHOGENESIS OF TUBERCULOSIS


Primary TB Infection Exogenous in Origin
Preallergic Period 3-8 Weeks Duration
Early Allergic 2-24 Months
Late Allergic State Healing Duration Many Years
Exogenous Reinfection
Endogenous A Reinfection
Endogenous B Reinfection
Permanently closed, uncomplicated, first infection type. Biological survival of tubercle bacilli not possible.
Bone and Joint
Serous Membranes: Peritonitis, Pleurisy, Miningitis.
Extra-thoracic: Viscera, Kidney, Spleen, Adrenals, Lymphatics.
Miliary Tuberculosis
Local auto-inoculation
Pulmonary Tuberculosis (Consumption)
Larynx
Pulmonary Complications Following:
Therapy
Progress of Disease
Gastro-intestinal Tract
Local auto-inoculation

1. Focalization of tubercle bacilli. Phagocytosis.
2. Conversion of monocytes to epithelioid cells and tubercle formation.

Symptomless

1. Lesion may be seen on x-ray film.
2. Acute stage now stationary.
3. Progressive resolution.

Fever
Tuberculin Sensitivity
Caseation

1. Virulent tubercle bacilli may be present for many years.
2. Revascularization, calcification, or ossification of primary lesion.
3. Death of bacilli and disappearance of allergy may complete the cure of the primary TB infection. This often does not occur during one span of life.

Symptomless

Endogenous A develops as a result of extension or reactivation from the primary lesion.

Endogenous B develops following excitation of primary infection through exogenous reinfection. Under varying environmental conditions either type may predominate.

development of dangerous sequelae (serious secondary type of tuberculosis) if these early infiltrations were kept under observation during the period of development and subsidence. The doctor would have an opportunity to know just what his infected families were experiencing, and he would also be in a position to aid in their protection against the development of secondary tuberculosis, knowing just what was occurring in each of the individuals concerned.

The medical staff of the State Sanatorium feels that every doctor's practice must continue to be a personal responsibility as well as a professional obligation. The doctor must be prepared to render his services to the families that constitute his practice. It is the policy of this institution to receive patients as a loan from the private physician, maintaining the physician's interest in his patient's progress at the sanatorium by frequent reports at regular intervals to the doctor, and finally returning the patient as soon as the sputum is consistently free from tubercle bacilli.

NEWS ITEMS

Dr. S. A. Olson, formerly of Minneapolis, is now located at Glendive, Mont., at the Northern Pacific hospital.

Dr. F. Koren, Watertown, S. D., was in New York City, spending a few weeks on a business and pleasure trip.

Cass Lake, Minn., will have a new hospital that will cost at least $100,000, whose use will be exclusively for Indians.

Construction of an addition to St. Barnabas hospital, Minneapolis, costing $150,000, will be started in the early spring.

Dr. M. E. Henderson, Rochester, Minn., was recently elected president of the American Academy of Orthopedic Surgeons.

Dr. Charles N. Spratt has been elected president of the Eitel Hospital staff, Minneapolis, and Dr. Frank R. Hirschfield, secretary.

Aitkin, Minn., will entertain the members of the Upper Mississippi Medical Society at its spring meeting, dates to be arranged later.

Dr. William N. Kendrick, a well known physician of Spring Valley, Minn., passed away recently after a brief illness at the age of 63 years.

Dr. C. A. Bultler, Eagan, will return to his former location at Lake Preston, S. D., and resume his general practice after an absence of two years.

Dr. H. L. Huffington, Mankato, Minn., is in Los Angeles, Calf., where he will spend several weeks in post graduate work in eye, ear, nose and throat.

Dr. T. C. Davis, Wadena, Minn., has been honored for three successive years, by being named president of the Commerce Association of that city.

Dr. E. P. Quain, Bismarck, N. D., who has travelled extensively to all parts of the globe, is now engaged in writing a book on his South American trips.

Watford City, N. D., are planning on the erection of a new hospital this season. Committees have been appointed to secure the location and the money required.

Dr. R. C. Webb, Minneapolis, was the guest speaker at the February meeting of the Twin City Society of X-ray Technicians, his subject being "Bone Radiography."

Dr. Carol C. Carpenter, well-known physician and surgeon of Minneapolis, died last month at his home, following an illness of several months. He was 72 years old.

The new Minnesota Soldiers Hospital was dedicated last month. The hospital replaced the old one at a cost of $250,000, and will accommodate 125 beds with the latest medical facilities.

Dr. E. J. Simons, Walker, was the guest speaker at a recent meeting of the Todd County Medical Society, held at Long Prairie, Minn., Dr. Simons presenting a paper on "Medical Economics."

Dr. O. A. Britell, a prominent physician and surgeon of Whitefish, Mont., passed away last month, following a sudden attack of pneumonia. The doctor was graduated at Rush Medical College in 1903.

Dr. Hogbert Rice, formerly of Thief River Falls, is now located at Moorhead, Minn., having purchased the practice of the late Doctor H. J. Thornby. Dr. Rice is a graduate of the University of Minnesota.

The Rosebud Medical Society held its annual meeting at Mission, S. D., and elected the following officers: Dr. E. C. Smith, Mission, president; Dr. A. O. Carmack, Colome, vice-president, and Dr. R. V. Overton, Winner, secretary.

Dr. A. F. Bratrud, Minneapolis, was the guest speaker at the annual meeting of the Aberdeen District Medical Society, the doctor presenting a paper on "The Ambulant Treatment of Hernia." Dr. Robert Hill, president of the society, presided.

Dr. William S. Fullerton, 79 years old, who had been a physician and surgeon in St. Paul since 1900, died Friday, February 7. Dr. Fullerton had been in ill health for more than a year. He gave up active practice about three years ago.

Dr. C. E. Alexander, chief of obstetrics at St. Luke's hospital, Duluth, died last month in that hospital following a head injury received in a fall. He was born and educated in Minneapolis, graduating from the University of Minnesota in 1924.

The Sixth District Medical Society elected new officers at its annual meeting held at Bismarck last month, Dr. L. G. Eastman, Hazen, president; Dr. G. M. Constance, Bismarck, vice-president, and Dr. L. W. Larson, Bismarck, secretary.

Ten years of medical research gained Dr. Owen H. Wangensteen, head of the department of surgery at the University, the award of the Samuel D. Gross prize in surgery, presented every five years by the Philadelphia Academy of Surgery.

On January 30, Dr. J. A. Myers, Minneapolis, spoke before the annual meeting of the Grand Rapids, Mich., Tuberculosis Society; on February 11, before the Lorain County, Ohio, Medical Society, and on February 18, before the St. Joseph County Medical Society at South Bend, Ind.

The Minneapolis Surgical Society recently gathered for its fourteenth annual "foundation banquet" in the Minneapolis Club. Noted medical men who attended include Dr. Frank Lahey of Boston, Dr. C. H. Mayo and Dr. W. J. Mayo of Rochester and officials of various northwest and national medical associations.

Members of the Stutsman County Medical Society, held its annual meeting at Jamestown, N. D., and elected Dr. Bertha B. Brainard, president; Dr. G. H. Holt, vice-president, and Dr. J. L. Conrad, secretary. After a fine dinner was served, Dr. J. S. McCartney, Minneapolis, presented an interesting paper on "Embolism."

More than 150 northwest doctors helped the Nicollet Clinic, Minneapolis, celebrate its fifteenth anniversary recently, at an informal dinner in the Radisson hotel. Dr. Jennings C. Litzenberg was toastmaster and Dr. S. Marx White directed plans for the dinner. Fred B. Snyder, president of the University of Minnesota's board of regents, and Dr. Walter Bierring of Des Moines, former president of the American Medical Association, were guest speakers.

The Sixth International Congress on Physical Medicine will be held at London May 12-16, 1936. It will consist of sections on kinesitherapy, physical education, hydrotherapy and climatotherapy, electrotherapy, actinotherapy, radiotherapy and radium therapy. American participants will sail from New York on May 2, on the MV Britannic and return on May 31, on the SS Transylvania. Dr. Richard Kovacs, 1100 Park Ave., New York, is Executive of the American Committee.

A special program of lectures and demonstrations in medicine will be held under the direction of the Mayo Foundation from April 6 to 10, inclusive. Mornings will be devoted to surgical and medical clinics. In the afternoons and evenings, in addition to clinico-pathologic conferences, symposiums will be conducted on various phases of gastro-enterology, urology, acute and chronic empyema, vascular diseases of the extremities, hypertension, orthopedics, and oral and plastic surgery.

The Minnesota State Medical Association broadcasts weekly at 10:00 A. M. every Monday over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: March 2, "Asthma in Children"; March 9, "The Parathyroid Glands"; March 16, "Tonsils"; March 23, "Cause of Anemia"; March 30, "Dental Caries."

The Third Annual Lecture in the E. Starr Judd Lectureship in Surgery, established at the University of Minnesota by the late Dr. E. Starr Judd, will be given by Dr. Frank C. Mann, Professor of Experimental Surgery in the Mayo Foundation. The lecture will be held in the Music Auditorium on the University campus in Minneapolis on Tuesday, March 17, at 8:15 p. m. The subject of Dr. Mann's lecture will be "Hepatic Physiology and Pathology from the Surgical Viewpoint: A review of experimental investigations."

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INTRODUCTION

by

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Again the April issue of The Journal-Lancet *is devoted to tuberculosis. It will find the interest with which last year's number was received undimmed.*

Epochal events in the epidemiology of certain preventable diseases have given each in turn the brief rôle of prima donna—vaccination for smallpox, anti-toxin in diphtheria, typhoid immunization. Tuberculosis has not yet had its great moment in the drama of medical history, yet it is among the oldest characters in the play. No public health performance is complete that does not include tuberculosis as the dependable villain of the sketch.

The lure of its mystery holds us. It is the leading unsolved enigma of preventive medicine, yet keen detectives are on its trail. Its depredations have been vastly limited.

While awaiting the dénouement with what patience we may, we review the scenes unfolded during 1935 with a sustained suspense aroused by the forward march of one of the most thrilling dramas on the vast stage of human welfare, the conquest of tuberculosis.

Fallacies in Interpreting the Tuberculin Reaction*

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New Orleans, La.

SINCE the introduction of the tuberculin reaction into clinical practice by Mantoux in 1907, the test has passed through cycles of varying degrees of enthusiasm. At the present time, it occupies a place among the really useful laboratory procedures. Of much greater importance than its popularity as a diagnostic measure is its value in attracting attention to the many changes in concepts of tuberculosis. Clinical concepts of tuberculosis are naturally very much different than they were a quarter of a century ago, and the tuberculin reaction has figured largely in the development of these ideas. The most important single thing is the newer interpretation of a fact known more than a quarter of a century: The tuberculin test distinguishes between those infected with tuberculosis and those uninfected.

Mere statement of this fact arouses little interest because superficially this has long been accepted although its true significance has been obscured by a mass of conflicting reports most of which were founded on inadequate evidence and insufficient clinical and experimental research. Concerning the tuberculin test and its value, fallacies abound; these fallacies will be discussed separately. Suffice it to state here that the tuberculin test distinguishes between those who have been infected with tuberculosis and those who have not or, to phrase it according to the modern concept, the tuberculin reaction distinguishes between those who are tuberculous and those who are non-tuberculous.

1. *The Test Is Worthless Except for Children*—This is the most important of all fallacies. Because it is so widely believed that "nearly everyone has much or little of tuberculosis," many physicians have been lead to feel that only exceptional individuals mature without being infected with tuberculosis. It is accordingly felt that nearly every adult has a positive reaction and that there is no value in performing the test on anyone older than 12 years. If this fallacy is to be dispelled, its source must be ascertained.

When the tuberculin test was introduced in 1907, Pirquet and Hamburger applied it to a group of children in Vienna and found about 95 per cent to be positive. This single report has so firmly impressed itself on the minds of medical men that they failed to note that it concerned children in a municipal hospital, children from families where tuberculosis abounded at a time when anti-tuberculosis campaigns in the modern sense were unknown. It was to be expected that many of them would react positively because so many of them actually had tuberculosis whether or not the disease was detected at the time. To believe that the same thing holds true for today is to believe that all the work done since that time to prevent the transmission of tuberculosis has been for naught. If individuals are today as much liable to be infected with tuberculosis as were the children of the less favored portions of Vienna in 1907, then nothing has been accomplished since that time to lessen the spread of tuberculosis, and tuberculosis is as common today as it was then. The converse of this reasoning also applies: If continuation of anti-tuberculosis campaigns is to be considered, it must be shown that since these campaigns were instituted the spread of tuberculosis has been checked.

Fortunately, there is abundant evidence for all of this. It is a matter of general knowledge that the death rate from tuberculosis has fallen markedly. Mortality and morbidity rates have decreased markedly during the past quarter-century. Correspondingly the spread of tuberculosis has been diminished. This statement is verified by the reports that in certain sections of the country tuberculous infection is becoming lessened among areas susceptible of repeated examinations. In some portions of the Middle West,[1] less than one per cent of the Freshmen entering universities have positive tuberculin reactions, of 1,000 children of all ages entering the Mayo Clinic,[2] only 16 per cent reacted positively. This is in contrast to the finding of 75 per cent positive reactors among children tested in portions of the country where the population is massed together in a relatively small area, and the tuberculosis death rate is above the average for the entire country. Chadwick and Johnston[3] warn that the incidence of tuberculous infection varies greatly throughout the country and that it is unwarranted to draw any conclusions unless large numbers of determinations are made upon all sections of a given community. One of the largest surveys of the country, that of the Massachusetts ten-year program, included more than 100,000 determinations; only 28.5 per cent of these children reacted positively. An interesting study is that of Ustvedt,[4] of Norway, who found that in 1934 about 24 per cent of the children of a certain town reacted positively, whereas Arnfinsen had found 38 per cent of them to react positively when he had tested the children of the same town 20 years previously. He was furthermore able to show that the primary infection was acquired at a later period in life as the morbidity and mortality rates fell. This indicates that as the spread of tuberculosis is diminished, children are prevented from acquiring it or else do not acquire it when quite so young. Throughout the country there have been conducted surveys of the reactions of students to tuberculin, and from all of them it is becoming increasingly evident that the tuberculin test is of immense value at any age in distinguishing the tuberculous individuals from the non-tuberculous and that the determination should be part of every general physical examination.

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*Prepared especially for the Tuberculosis issue of THE JOURNAL-LANCET.

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2. *Tuberculin Testing Is Dangerous*—The fear that exacerbation of a tuberculous process may be caused by the intradermal injection of tuberculin is not very well founded. A previously unsensitized (uninfected) individual cannot be sensitized by the intradermal injection of tuberculin while an individual already sensitive to tuberculin because he has been infected with tuberculosis is not harmed by injecting tuberculin intradermally. Those occasional instances of moderately severe reactions following the tuberculin tests are usually not attended by any serious consequences and generally mean that some of the material has been injected subcutaneously; this is, of course, improper performance of the test. Whenever exacerbation follows closely the administration of tuberculin, it is most probable that the individual is highly sensitive to tuberculin and would have spontaneously undergone reactivation of his tuberculosis even without the skin testing.

3. *A Positive Reaction Does Not Indicate an Active Infection*—This prevailing opinion has so captivated the minds of medical men that most of them minimize the finding of a positive tuberculin reaction. Undoubtedly this fallacy arose because no evidence of tuberculosis, such as we know it clinically, could be discovered in individuals who had positive tuberculin reactions. It was not then appreciated that the methods of detection of tuberculosis have become much more sensitive within recent years and that many of those originally discarded as non-tuberculous would today be classified as tuberculous. Even today, we are failing to find many cases of tuberculosis simply because our means of diagnosis are not sufficiently sensitive. Although the x-ray is widely utilized, its use is still not as common as it could be. There are still those who have not yet come to realize that by means of the radiograph many lesions can be discovered 2-3 years before they are large enough to be detected by means of physical examination. Again, some observers have attracted attention to the fact that some lesions cannot be detected in the ordinary anterior-posterior view of the pulmonary fields; some of them are too small to be detected at the original examination while others are obscured by the cardiac shadow. Not infrequently, the primary lesion of tuberculosis is extrapulmonary and in a portion of the body which cannot very well be explored by the Roentgen ray.

It can be noted in a review of the literature that there is developing the belief that tuberculous infection and tuberculous diseases are in reality varying degrees of one and the same process and that distinctions between the two are fallacious. It may be said that not only is such distinction fallacious but more than that it is harmful for it tends to foster the idea that a positive reaction indicates only "infection" and thereby lulls the observer into a sense of false security.[5] Some individuals with positive reactions have been examined carefully and found to have no Roentgen-ray or other evidence of active pulmonary tuberculosis, yet tubercle bacilli have been isolated from their bodily excreta: stools, sputa and urine. Robertson[6] examined 3,000 cadavers at the Mayo Clinic and found that in 62 per cent of them there were unmistakable evidences of pulmonary tuberculosis. Many of these had been examined closely ante-mortem, and no signs of tuberculosis could be ascertained by the usual clinical measures; yet viable acid-fast bacilli could be isolated from the tracheobronchial tree. In some of them he found lesions which had not only the radiological appearance of healing but also all the gross markings of well-calcified lesions; yet from these, too, he could isolate acid-fast bacilli. It must be recalled that there is no test for determining healing in tuberculosis or even for the determination of quiescence; a patient is said to have "arrested" tuberculosis only when no signs of activity can be found.

From all the foregoing, it is obvious that the maxim, "Once tuberculous, always tuberculous," is not without substance and that if the tuberculin reaction records infection with tubercle bacilli, it likewise portends tuberculous disease although this may be sub-clinical and not demonstrable; this is true only because our methods of diagnosis do not permit us to diagnose such lesions. It may be that we shall finally arrive at the conclusion that the diagnosis of latency means simply the inability to demonstrate activity and that wherever tuberculosis remains quiescent throughout life, it is merely sub-clinical and under control but always apt to undergo exacerbation.

We cannot, therefore, arbitrarily dismiss people with tuberculin sensitivity; we must observe them at regular intervals. It is from such people that the next cases of clinical tuberculosis will come. It is from such as these that the "active" cases of tuberculosis will be drawn to perpetuate the process of infection. We do not know why some children of a group of positive reactors will eventually develop recognizable tuberculosis and some will not; we know only in the most general sort of way that activation of such lesions is apt to be associated with deficiencies of diet and with repeated exposure to the disease. It is certainly illogical to consider any scheme for preventing the dissemination of tuberculosis unless that scheme embraces a study of such children who have been consigned, but not yet delivered, to the ravages of tuberculosis. Now that it is known that children may have no demonstrable lesions at all and yet harbor viable tubercle bacilli within their bodies, it is evident that such children may be the unsuspecting and unsuspected transmittors of the disease.

The tuberculin test, therefore, becomes an exquisitely sensitive device which informs us which persons may conceivably be the disseminators of tuberculosis and which people cannot possibly be such disseminators.

4. *A Positive Reaction Indicates Immunity and Is Therefore an Asset*—Although the relationship of immunity to arrest of tuberculosis is most indefinite and most of the experimental work indicates a wide disparity between the processes of immunity and of allergy, it is still currently believed that a positive tuberculin reaction is an asset and indicates protection against the onslaughts of tuberculosis. Only too often it is forgotten that the tuberculin reaction measures only allergy the relationship of which to immunity has yet to be proved. The data at our disposal would indicate that 21-28 days after tubercle bacilli enter the body, there is produced a state of allergy evidenced by the occurrence of edema and inflammation wherever tuberculin is subsequently injected intradermally. Johnson,[7] Howard and Maroney studied allergy and immunity by using quantitative tuberculin tests on children with primary types of infection and found that when parenchymal lesions were at their height, allergy was at its lowest level; as the lung lesions resolved and the hilar nodes enlarged, allergy markedly increased; when the hilar nodes became smaller and calcified, allergy again waned. It is evident that the arrest of the disease is accompanied by the decrease of allergy whereas if allergy and immunity were related to each other, and if arrest of the disease is accompanied by accentuation of the powers of immunity, there should be a corresponding increase in the degree of allergy.

Additional evidence that the degree of allergy has little to do with the state of activity is afforded by studies with the so-called quantitative tuberculin reaction. It is possible to administer varying amounts of tuberculin intradermally by injecting the same amount of solution each time but altering the strength of the solution.[8, 9] It was hoped that there could be discovered a threshold level above which active tuberculosis would be indicated by reaction and inactive tuberculosis by lack of reaction; i.e., that there could be discovered such an amount of tuberculin that would not produce a reaction in a person with quiescent tuberculosis but would produce a reaction wherever there was active tuberculosis.[10, 11] Most well-controlled studies have failed to find such a quantity. There have been some reported successes,[8, 9] but the findings are equivocal. Frequently, marked reactions are found in individuals with minimal involvement, while slight reaction may occur in the presence of advanced lesions.

DeSavitsch and Butler[12] infected guinea pigs with tuberculosis and then studied the effects of reinfecting them with tubercle bacilli. They found that the immune processes seemed to be unaffected by the degree of allergy and that the allergy seemed to make the animals more susceptible to pulmonary cavitation. Smithburn, Sabin and Geiger[13] infected guinea pigs with tuberculosis and later injected some of them with tuberculoprotein, thereby producing a definite sensitiveness to tuberculoprotein itself. They found that this seemed to make very little difference in the course of the tuberculosis in these animals. Other observers have attracted attention to the fact that as an individual recovers from pulmonary tuberculosis, he has a naturally increased state of immunity while his degree of allergy may wane.

It is often stated that the acquisition of a positive tuberculin reaction is an asset and protects the child from succumbing to massive invasion of tubercle bacilli. It is accordingly believed that miliary tuberculosis is one of the dangers encountered by those who have never had a "protective" infection with tuberculosis. By these writers, miliary tuberculosis is believed to arise from an "overwhelming" infection in a person who has never been "protected" by having an infection with tubercle bacilli just great enough to confer the requisite degree of immunity and just small enough not to cause actual disease. Just how one can distinguish between the dosage of infecting organisms is not at all clear. It is of interest in this connection to recall that Schurman[14] found acute miliary tuberculosis in individuals in the sixth and seventh decades although they had well-calcified pulmonary lesions. Certainly in these people, the positive tuberculin reaction caused by this earlier form of tuberculosis did not protect them against miliary invasion.

It should be evident from all the above that the positive tuberculin reaction is a definite liability; it indicates that the individual has already been rendered vulnerable to the ravages of tuberculosis and that somewhere within his body are viable tubercle bacilli which may give rise to detectable disease. If he is fortunate, his span of life may be completed before this occurs.

5. *The Reaction May Be Negative During the Course of Tuberculosis*—It is comparatively easy to disprove this belief because it is necessary only to show that if a sufficient amount of tuberculin is used, most of the so-called negative reactors among those definitely tuberculous will have a positive reaction. There is a smaller group of tuberculous people who fail to react temporarily. This temporary loss of power to react is seen most often in far-advanced tuberculosis and in acute infectious diseases, notably the exanthemata. It was formerly believed that this indicated loss of allergy to tuberculin, but this is probably not so. It is more likely that this indicates diminished cutaneous circulation.[15] Whenever there is widening of the capillary bed, such as is seen during the course of some exanthematous diseases or in debilitation, any foreign substance introduced within the layers of the skin will be washed away too quickly for the formation of the typical wheal of reaction. As soon as the particular illness subsides, this change of capillary circulation disappears, and the individual regains his power to react to the intradermal introduction of foreign matter.

Summary and Conclusions

The intradermal tuberculin test is one of the most valuable diagnostic measures we have today; it measures only allergy to tuberculoprotein, but this fact in itself is sufficient. A positive reaction indicates that the possesssor has been infected with tubercle bacilli and harbors viable organisms somewhere in his body, organisms which may some day cause sufficient disease to be detected clinically. Whenever the amount of damage becomes great enough to be detected clinically, the individual is said to have active tuberculosis. Inasmuch as there is no known "cure" for tuberculosis the absence of clinically demonstrable disease means simply that all pathologic processes are sub-clinical and are held below the level of detection—either therapeutically by means of appropriate management or spontaneously by means of the "natural resistance" of the body. Our problem for the future is twofold: To prevent uninfected people from allowing tubercle bacilli to enter their bodies and to prevent these apparently healthy positive reactors from developing active tuberculosis.

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The Role of the Chest Roentgenogram in Tuberculosis—An Evaluation of the Various Diagnostic Factors*‡

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THE modern concept of pulmonary tuberculosis recognizes the need for a definite differentiation between the terms "Tuberculosis" and "Consumption." Thus one considers the potentially curable types as contrasted with pulmonary tuberculosis in its neglected, consuming, and hopeless form. The late clinical stages are detected without difficulty. Some states[1] still have laws relating to public health which suggest that the diagnosis of this type of case may be obvious from the symptom standpoint alone and so requires direct examination of "any person suspected upon a well-founded belief to be suffering from open pulmonary tuberculosis—." The entire scale of lung "sounds" and signs may be elicited from the examination of the chest of the consumptive individual and such patients frequently serve as subjects for demonstration before medical student groups. Medical schools are at the same time risking over-emphasis of the value of physical signs for the detection of the earlier forms of the disease.[2] The diagnostic criteria for the "consumptive" have relative values in this order: Symptoms (marked—subjective and objective); Sputum (positive); X-ray (corroborative only—perhaps a "snow-storm"); Physical Signs (seldom absent); History (wholly unimportant—for diagnosis). (See Figure IV).

"Tuberculosis" is now recognized as a preventable and curable disease. The prospects for recovery are enhanced if diagnosis is made before the triad of positive sputum, physical signs (râles), and symptoms are all of them present. For such earlier diagnoses it has not been found necessary to supplant any of the old established criteria but only to re-evaluate their relative importance. The literature furnishes adequate evidence in support of revised values for the usual criteria,[3] and in addition urges upon us a more prompt acceptance of this new era in the diagnosis of pulmonary tuberculosis, for history reveals that there is usually an important time interval before wide-spread adoption by the general practitioner can be expected.[3, 4]

The symptom-complex including malaise, impaired digestion, recent loss of weight, protracted convalescence from respiratory infections, breathlessness, etc., is considered to precede, in point of time, the symptom group which is dependent upon ulcerations into the bronchi[5] or severe tuberculo-toxaemia, and which are characteristic of the advanced lesion. As a matter of fact, tuberculosis may be present without presenting any symptoms of which the patient may be aware.[6] The N. T. A. Diagnostic Standard warn, that the failure to find bacilli in the sputum even after many examinations provides no proof of the absence of tuberculosis.[7] Lawrason Brown, in a study of 503 cases of pulmonary tuberculosis with no abnormal physical signs, proved conclusively that active pulmonary tuberculosis could exist in formidable degree without the occurrence of the usual physical signs and that, therefore, failure to elicit abnormal physical signs does not mean the absence of pulmonary tuberculosis. From the more positive side there is the accepted X-ray observation that definite parenchymal changes may be seen in practically every instance of proved parenchymal tuberculosis of active or clinical character.[7, 8, 9, 10, 11] Now, Ellman's[12] reference to the controversies of the past with respect to the relative importance of stethoscope and X-ray may be brought up to date by the more recent comments of Braeuning[3] who contends that early pulmonary tuberculosis should be seen and not heard.

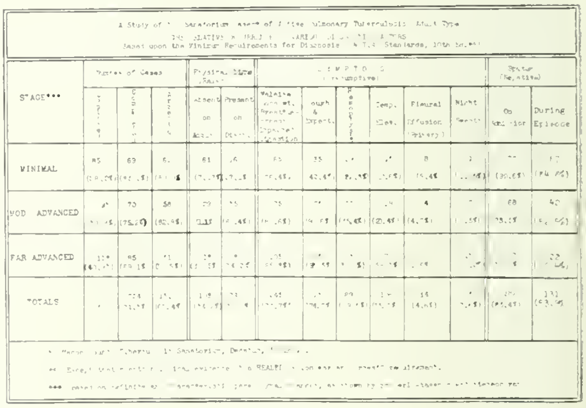

FIGURE I

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‡To be read before the annual meeting, Illinois Tuberculosis Association, April 7, 1936, at Decatur, Ill.

A recently completed study of 301 Sanatorium cases with active pulmonary tuberculosis, adult type, suggests relative weights which must be assigned to the various diagnostic factors. (See Figure I) A review of these findings as they concern *minimal* tuberculosis only, points out, first of all, that the sputum examination may be expected to fail, diagnostically, in 90.6 per cent of the proven cases; the temperature ranged within normal limits in 82.4 per cent; physical signs (râles) were absent in 71.7 per cent; cough and expectoration were not "symptoms" in 57.6 per cent; the separate symptom-complex of the "early" case (with chief importance that of furnishing a "lead" to the necessity for supplementary diagnostic procedures) was present in all but 23.6 per cent. When summarizing this study to include all stages of active pulmonary tuberculosis (curable form) there appears ample justification for the following order of relative values: X-ray (minimum standard of quality and proper interpretation); Symptoms (slight or absent); Physical Signs (slight or absent); History (contact); Sputum (negative or positive). (See Figure IV)

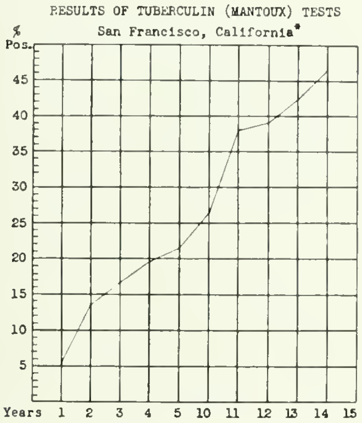

*Diagram produced from compilation of data, New and Supplementary Facts and Figures about Tuberculosis, N.T.A., Whitney, 1935.

FIGURE II

The outstanding contributions of Myers, McPhedran, Rathbun, and many others, have provided an altogether new conception of tuberculosis as it occurs in childhood. The primary, or first infection type, of tuberculosis has been carefully studied and its relationship to the so-called early adult apical, or re-infection type of pulmonary tuberculosis has been clearly portrayed.[13] Out of this work there has evolved a new and separate diagnostic set-up requiring the addition of the intradermal tuberculin test,[14] together with oblique[15] or rotation,[16] as well as the usual postero-anterior chest film exposures. The constantly increasing value of the tuberculin test comes from a lessening of the opportunity for infection, together with postponement to a later period of life—results of a lowering morbidity and mortality rate from tuberculosis. San Francisco,[16] taking a recent example from a large urban center, shows an infection rate curve which reaches only 46 per cent at the early teen age. (See Figure II) The Mantoux test and the chest X-ray form an indispensable unit in the examination of the chest of a child without which a conclusive diagnosis could otherwise rarely be made.[17] And yet, for this type of tuberculosis the history of contact becomes a factor of utmost significance assuming first place in relative diagnostic value. Lesions which are of progressive character may still produce no recognizable subjective symptoms.[18] The anatomic location of tracheobronchial tuberculosis being without the pulmonary parenchyma, (See Figure III) offers reasonable explanation for the inability to demonstrate most phases of childhood type of tuberculosis by physical examination.[19] For the diagnosis of so-called childhood tuberculosis, therefore, we have the following universally accepted relative values: History (important—contact); Tuberculin—intradermal (Mantoux); X-ray (P. A. and oblique or rotation techniques); Symptoms; Physical Signs. (See Figure IV)

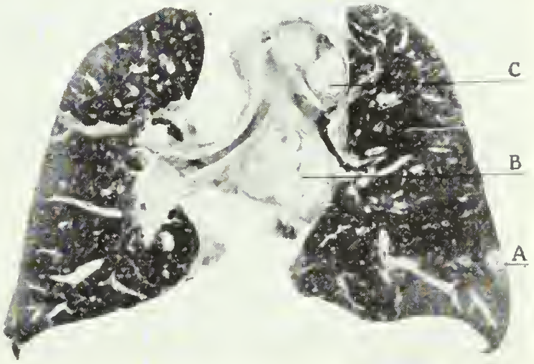

FIGURE III

The rôle of the chest roentgenogram has been shown to be the most important single factor in the diagnosis of tuberculosis of the bronchopulmonary tract. However, there must be reservations which involve basic standards of quality, comparability, and interpretation.[20] A definition of the type of roentgenogram necessary to exclude the presence of an anatomically demonstrable lesion can be briefly given as one in which

DIAGNOSIS OF PULMONARY TUBERCULOSIS

I. *Tuberculosis* (Curable)—Stages: Minimal; Mod. Adv.; Adv.
  1. X-ray—Minimum Standards.
  2. Symptoms—slight or absent.
  3. Physical Signs—slight or absent.
  4. History—contact.
  5. Sputum—negative or positive.

II. *Advanced Phthisis* (Consumption)
  1. Symptoms—marked (subjective and objective).
  2. Sputum—positive for tubercle bacilli.
  3. X-ray—corroborative only ("snow-storm").
  4. Physical Signs—seldom absent.
  5. History—wholly unimportant.

III. *Childhood Tuberculosis* (Tracheobronchial—parenchymal, basal.)
  1. History (important—contact).
  2. Tuberculin—intradermal (Mantoux).
  3. X-ray—P. A. and oblique techniques.
  4. Symptoms.
  5. Physical Signs.

FIGURE IV

there is sharpness and comparability of the shadows of broncho-vascular markings visualized with contrast, from apex to base and from hilum to the lateral chest wall.[21] Bridge[22] and Warren[23] have set the basic techniques for a fairly satisfactory chest film at 100 milliamperes, 48-50 inch distance, and 1/10 second exposure. All are agreed that a broad focal spot[24] or lack of speed may result in a distortion of markings which may simulate early tuberculosis, while over-penetration might obliterate the evidences of minimal processes.[11] McPhedran stresses the importance of rotation views to project the lung that lies behind the hilum and heart shadow and necessary for an adequate exploration of the chest.[10] Oblique and lateral views are, of course, required for a proper study of the mediastinal lymph node areas. Stereograms are superior for the critical examination of the finer pulmonary structure which is essential in early tuberculosis.[25]

The proper interpretation of the chest roentgenogram is, of course, of final importance. There exists the tendency to over-interpret the chest film.[11] Dunham[26] has aptly used the aphorism, "Shadows do not lie, but inexperience may make inferences faulty." Sewell[27] considers that its interpretation needs a clinician. The general roentgenologist should take advantage of any opportunities which might afford a proper relationship with the phthisiologist, thereby adding to his usefulness as an interpreter of the earlier forms of the disease.

Summary

1. For purposes of tuberculosis control and to provide a greater hope for recovery in the individual patient we should consider, diagnostically, at least three (3) clinical forms of pulmonary tuberculosis—Early Adult, Childhood, and the "Consumptive." The existing criteria are retained though their relative values vary in importance with each form.

2. A study of 301 sanatorium cases of adult tuberculosis (all stages) shows that the diagnostic importance of the usual criteria varies also with the degree of advancement.

3. The chest roentgenogram assumes a case-finding rôle of first importance for the early adult lesion, with values lessening until the late clinical stages render it a factor of corroboration only.

4. The lesions of childhood are frequently combined, parenchymal and tracheobronchial. The tuberculin test screens out the infected and requires supplementary X-ray examination for every reactor. Such films should explore mediastinal and paracardial as well as those areas usually visualized in postero-anterior films.

5. A separate symptom-complex (malaise, breathlessness, recent loss of weight, impaired digestion, etc.) is useful as a "lead" for the earlier diagnosis of the adult form.

6. Basic standards of quality and interpretation enhance the diagnostic value of the chest stereogram.

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Tuberculosis in Children*

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TUBERCULOSIS has become increasingly interesting in recent years particularly to those physicians whose practices include contact with children, because of studies which have led to clearer conceptions of diagnosis, classification, pathogenesis, and prevention, than existed a decade or more ago.

The value of tuberculin as a reliable diagnostic agent has been amply demonstrated and, a fact of great importance, more and more physicians have learned to use it, and are using it correctly in their daily practices. The campaign in favor of the more sensitive and reliable Mantoux or intradermal test has been fruitful, so that today this type of test has practically superseded all others. At present Koch's Old Tuberculin is undoubtably the most widely used material, but it seems probable that in the future, for the sake of uniformity of results secured and of ease in preparation, it may be replaced by the new product Purified Protein Derivative. This new substance, usually referred to by its abbreviated title P.P.D., is now available on the market in tablet form. It represents the active principle of tuberculin freed of all extraneous matter. Tablets of two strengths are supplied—the first containing 0.0002 mg. and the second 0.05 mg. of purified protein derivative per quarter grain of lactose. Accompanying the tablets are 1 c.c. vials of diluent. In using this preparation, therefore, it is merely necessary to dissolve the tablet in the diluent, and ten doses of either first or second strength material are provided. Admittedly, this is a much simpler product for the average physician to prepare in his office than O.T., and he can be assured that it possesses all of the advantages of the latter, and lacks some of its disadvantages.

A positive tuberculin test means that a tuberculous infection exists somewhere in the body, but it tells nothing more. It does not differentiate between a benign first infection and a serious reinfection form of tuberculosis. It does not tell whether the infection was acquired recently or a long time ago unless the reaction has been previously determined. Nor does it distinguish an active process from a quiescent one. To determine these factors recourse must be had to the X-ray and to clinical examination. It seems important that these limitations in the interpretation of a positive tuberculin reaction be kept in mind in dealing with one's patients, lest they obtain the erroneous conception that a positive tuberculin test is synonymous with consumption; or, on the other hand, the equally erroneous conception that a positive tuberculin test is universal and, therefore, without significance.

A contribution of great value to the physician in classifying the various types of tuberculosis encountered, is the Lymanhurst classification published by Stewart, Harrington, and Myers.[1] This classification is the result of fourteen years of experience in the study of more than 12,000 children who have been examined for tuberculosis at Lymanhurst, and is applicable to all forms of tuberculosis in children diagnosed during life.

Lymanhurst Classification

I. First infection type of tuberculosis (primary tuberculosis).
  A. Non-demonstrable by X-ray.
  B. Demonstrable by X-ray.
    1. Primary intrathoracic tuberculosis (childhood type according to Diagnostic Standards).
    2. Primary intra-abdominal tuberculosis.
    3. Primary tuberculosis of cervical region.
    4. Primary tuberculosis of other parts of the body.

II. Super—or reinfection type of tuberculosis (secondary tuberculosis).
  A. Super—or reinfection type of pulmonary tuberculosis.
    1. Phthisis (the adult type according to Diagnostic Standards) (Minimal, Moderately advanced and Far Advanced).
    2. Tuberculosis pneumonia.
    3. Miliary tuberculosis.
  B. Tuberculosis of other viscera.
  C. Bone and joint tuberculosis.
  D. Tuberculosis of serous membranes.
  E. Tuberculosis of skin.
  F. Miscellaneous reinfection types of tuberculosis.

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The conception that tuberculosis exists in man in two fairly distinct but intimately related types of disease is now generally accepted. First infection tuberculosis is always of exogenous source and results when living virulent tubercle bacilli are successfully implanted upon tissues which are not sensitive to tuberculoprotein. Super—or reinfection tuberculosis—may be of either exogenous or endogenous source, and results when living virulent tubercle bacilli are successfully implanted in tissues which have become sensitive to tuberculoprotein. Much evidence has accumulated to show that the above represents the evolutionary course of tuberculous infections whether the age period be in childhood or in the adult. For this reason it is felt that the terms first infection or primary, and reinfection or superinfection, are more appropriate and more inclusive than the corresponding previously used terms "childhood type tuberculosis," and "adult type tuberculosis."

Primary tuberculous infections are amazingly benign in character. At Lymanhurst a mortality rate of less than 0.5 per cent has been observed in this group of cases. As a rule the infection occurs, runs its course, and resolves to a calcified focus, fibrotic scar, or disappears altogether, without patient, parent, or physician being aware of what is taking place or has already taken place. In about 75 per cent of primary infections the positive tuberculin test is the only evidence that tubercle bacilli are present somewhere in the body. In the remaining 25 per cent the site of the lesion can be demonstrated by X-ray as being in the lungs, associated lymph nodes, or both, in the cervical region, or in the abdomen. There seems to be no logical reason why any greater significance should be attached to demonstrable foci of first infection type than to non-demonstrable foci, and this group of children all deserve the same consideration in so far as their tuberculous experience is concerned.

Occasionally the physician will have the opportunity of observing a primary pulmonary tuberculous infection in the acute stage. Such instances are not common, because usually not sought for. They are more likely to be uncovered in quite young children, and particularly where there is a known exposure in the home. Wallgren[2] has given a detailed description of the condition from his experiences with a hundred or more cases and Myers[3] has encountered it in 206 cases at Lymanhurst. While the following account represents what is known to occur from direct observation, it is probably true that all primary infections go through the same sequence of events to a greater or lesser degree. An incubation period of three to seven weeks follows the initial seeding of tubercle bacilli upon the non-allergic pulmonary tissue. This is the period of tubercle formation, and during this time diagnosis is impossible except by demonstration of tubercle bacilli in the gastric contents. Also during this period bacilli have travelled by way of the lymphatics to involve the regional lymph nodes.

The development of allergy or hypersensitiveness to tuberculoprotein marks the end of the incubation period. The tuberculin test now becomes positive and coincident with this there occurs a collateral inflammatory reaction about the primary lung focus sometimes amounting to a whole lobe. Swelling and hyperemia also occur in the involved lymph nodes. The child may develop a fever resembling that seen in influenza or other acute respiratory infections. It lasts from a week to two or three weeks and gradually subsides. As a rule it runs from 100 to 102 degrees but may even become as high as 105. If the tracheo-bronchial lymph nodes become sufficiently swollen a cough may be present, and if the trachea is compressed expiratory stridor may result. It is at this time that erythema nodosum of tuberculous etiology sometimes occurs.

Physical findings are likely to be surprisingly meager, even when the X-ray depicts an extensive pulmonary shadow. The degree of illness manifested by the child ordinarily is consistent with what might be expected in the usual respiratory tract infection, so it is not to be wondered at that this type of tuberculosis so frequently goes undetected. Even when the tuberculin test and X-ray suggest the possibility, a period of observation may be necessary before final proof is secured. The acute infectious pneumonias, foreign bodies, atelectasis, bronchiectasis, lung abscess, etc., must be considered in the differential diagnosis.

Following the febrile stage the acute pneumonic and lymph node process gradually undergoes a period of slow resolution during which, to all outward appearances, the child is in his normal state of health. From one to three years are usually required to reduce the primary complex to the point where only a calcified focus or a fibrotic scar remains.

Figures 1 and 2 show the X-ray films of Charles S., age nineteen months, who first came under the author's observation because of a fever he had been running for a week. From the history it was learned that his father was in a sana-

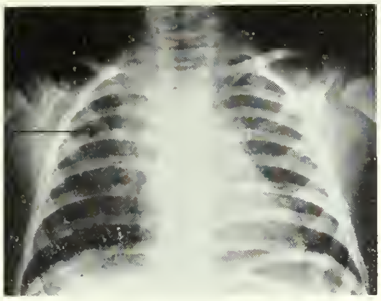

FIGURE 1
Chas. S., age 19 mos. Primary pulmonary tuberculosis. Acute stage.

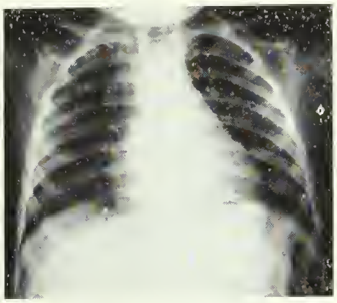

FIGURE 2
Chas. S., 15 mos. later. Shadow resolving. Calcium deposition begun.

torium with active tuberculosis. There was nothing in Charles' physical examination to account for his fever, but his tuberculin test was strongly positive. An X-ray film of his chest revealed a soft shadow extending into the right pulmonary field. No symptoms other than the fever were present, and no physical signs were ever elicited over the right lung, although searched for many times. Throughout the febrile course of about three weeks Charles ate with his normal appetite, and sat up in bed playing with his toys all the time he was awake. For a few weeks longer his mother was instructed to enforce extra rest during the day, but he was then permitted full freedom, and at no time up to the present has there been any indication of anything but normal robust health. The X-ray film in Figure 2, taken fifteen months after the first, shows the original shadow partially resolved and the beginning of calcium deposition in the central focus.

Figure 3 shows the X-ray plate of Charles' brother, age 5½ years. His tuberculin test was also strongly positive, but so far as his mother was aware he was perfectly well. She recalled that he had had, a couple of years previously, a febrile attack similar to that of Charles, but it had been diagnosed as influenza. In the film one can clearly see the Gohn tubercle to the left of the heart shadow which offers mute testimony to the fact that here an inflammatory reaction had undoubtably also existed at one time as in Charles' lung, but had gone on to resolution and healing unaided by any special therapeutic measures, and without anyone being aware that such a lesion was present.

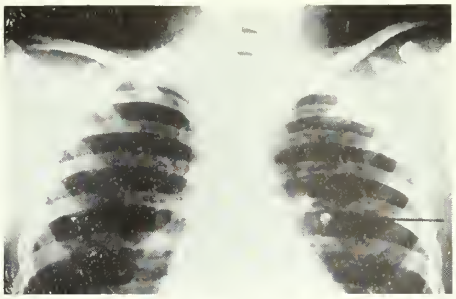

FIGURE 3
Lee S., age 5½ yrs. Brother of Chas. S. Large Gohn tubercle.

Not long ago five children in a family where the mother had died of tuberculosis a year previously, were presented for examination. All five of the children reacted strongly to tuberculin. There was no clinical evidence of tuberculosis in any of them, and yet the X-ray revealed a pulmonary lesion in the inflammatory stage in the two youngest, aged 3 and 4, and calcified lesions in the three oldest, aged 6, 7, and 9.

These cases serve to illustrate the point that even though first infection tuberculosis may occasionally occur as an acute pneumonic process, in the course of a few months this acute stage is passed, and such children then differ in no way from other children with primary tuberculosis.

In the past it was generally believed that calcifications of primary tuberculous infections seen in the X-ray films as Gohn tubercles or calcified lymph nodes were indicative of a healed process, and that no further danger need be feared from them. This view is not accepted in many quarters in the newer concepts of tuberculous pathogenesis. Complete healing would indicate the death of tubercle bacilli and, therefore, loss of allergy. There is considerable evidence that this does not occur in the lifetime of the human being. Robertson of the Mayo clinic has repeatedly demonstrated living tubercle bacilli in the centers of these calcifications at different age periods throughout life, and also it is a well known fact that the tuberculoprotein sensitive individual seldom loses his ability to react to tuberculin. It is the live bacilli in the centers of the calcified foci which maintain the allergic state of the tissues during the lifetime of the individual. Myers believes this is a double liability, and refers to it as a bomb planted within the body which may go off at any time with disastrous consequences. It is a double liability because nature eventually attempts to absorb the calcium about the bacilli, thus permitting their escape to seed themselves this time upon allergic soil with the resultant risk of a progressive destructive form of reinfection tuberculosis.

Turning now to discuss briefly the reinfection forms of tuberculosis, Stewart[4] gives the following reasons for grouping these clinically manifest types of the disease together as has been indicated in the classification. (1) The clinical characteristics of all secondary forms of tuberculosis have features in common which are different from those typical of primary varieties of tuberculosis; (2) the reinfection forms of the disease are responsible for most of the disability and appreciable illness as well as for practically all of the deaths due to tuberculosis and usually require special therapy; (3) they often display a tendency to cause progressive tissue necrosis to a marked degree; (4) and lastly these conditions are the direct product not of first infections but of endogenous or exogenous reinfections deposited in allergic tissues.

Just what proportion of the reinfection forms of tuberculosis is due to bacilli derived from primary foci (endogenous) and what proportion is due to outside sources (exogenous) is not known. Stewart feels that there is a dissemination of bacilli to various organs of the body from the point of initial implantation at the time of the primary infection. Thus multiple foci may be set up from which later endogenous reinfections may arise. A clinical observation may be recorded here which tends to support Stewart's contention. An eight year old boy suffered an injury which necessitated removal of his spleen. In the preliminary X-ray examination to determine the extent of his injuries a shadow was seen extending beyond the left border of the heart which was interpreted as a probable uncalcified tuberculous lymph node. In the parenchyma of the lung were suspicious calcium deposits. Sections were made of the spleen after its removal and typical tubercles were found. His tuberculin test proved to be positive, and the probable source of his infection was ascertained to be his grandmother with whom he had contact frequently.

Tuberculous meningitis and miliary tuberculosis are examples of acute reinfection forms of tuberculosis. They are responsible, of course, for the high mortality rate of tuberculosis in infancy. Wallgren[5] has recently shown the intimate relation of tuberculous meningitis to fresh primary pulmonary tuberculosis. He reports 166 autopsies performed on cases of tuberculous meningitis, in 82.6 per cent of which a fresh primary tuberculosis was found. In 39 additional cases X-ray evidence of fresh primary tuberculosis was found in 87.2 per cent. Orocz and Wallgren now have a group of sixty cases of tuberculous meningitis in which the time of infection or of the first manifestations of the primary tuberculosis was known. Two-thirds of all the cases of meningitis made their appearance between the first and second month after the onset of allergy, with a maximum of frequency at the sixth week. Only three cases were seen after the sixth month. Wallgren feels that early diagnosis of the primary tuberculosis and institution of proper therapeutic measures, such as are carried out in sanatoriums, may prevent tuberculous meningitis from developing.

Of the chronic forms of reinfection type tuberculosis phthisis or consumption is by all odds the most important. It is an interesting fact that it seldom occurs in children under ten years of age, but from this age on increases in frequency up to its high peak in women between the ages of twenty-five and twenty-nine, and at a later age in men. In the management of his children with positive tuberculin tests, therefore, the physician need not begin serial X-raying until this age has been reached, but from then on it is important that X-ray films be made of the chest annually or semi-annually until at least early adulthood has been safely passed. Significant apical lesions may be recognized in the X-ray film several years before the development of symptoms and at a time when the chances for a cure are greatest and before the patient has become a spreader of bacilli among his associates.

An important question which is receiving much attention in the literature, is the relation of primary infections to secondary reinfection forms of tuberculosis. Does a primary infection protect the individual against the danger of developing secondary tuberculous disease or is it an essential antecedent to the appearance in the human body of such serious forms of tuberculosis as meningitis, miliary tuberculosis, bone and joint tuberculosis, and phthisis? At present opinion is divided. Many hold the viewpoint that a successfully withstood primary infection imparts an immunity which enables the individual's tissues to cope with mild or moderate exposures but which fails when the exposure is too heavy or too frequently repeated.

The Lymanhurst physicians on the contrary, from their extensive experience in the last fourteen years, feel that primary infections are a distinct liability; that no form of tuberculosis to which man is susceptible is prevented by a first infection; and that the primary infection is the first step along the path which leads not infrequently to the development of serious reinfection varieties of tuberculosis. They point out that miliary tuberculosis and tuberculous meningitis develop frequently as complications of a freshly acquired primary tuberculosis. They further show that over 70 per cent of the 115 cases of phthisis which have been observed at Lymanhurst between January, 1922, and July, 1934, have occurred in children in whom their was a known pre-existing primary tuberculosis. Nine hundred thirty children who entered Lymanhurst with negative tuberculin tests were traced to see what form of tuberculosis they might subsequently have developed. Eighty-two had primary tuberculosis, whereas only seven had phthisis. They feel that a fundamental principle governing the pathogenesis of pulmonary tuberculosis in man is that during childhood susceptibility to the benign primary type of pulmonary tuberculosis is limited to uninfected children, whereas susceptibility to phthisis is limited to infected tuberculin sensitive children.

If these observations from Lymanhurst are correct, and there are many reasons to believe they are, then one can only conclude that it is far more desirable to grow up having a negative tuberculin reaction. It is the child with the positive tuberculin reaction who is the potential consumptive of tomorrow, and who, after the age of ten, requires close supervision roentgeneologically and physically, not only in his own interests, but for the sake of all those with whom he comes in contact.

The future conquest of tuberculosis will be conducted on many fields. Doubtless the greatest progress will be made in surveys of large groups of children under the supervision of public health authorities. Teachers, nurses, domestic servants, employees in factories and institutions, eventually will be required to be examined for tuberculosis. The tuberculous family is going to be followed more carefully in the future, since it is one of the most potent sources of contagion. The spreaders of tubercle bacilli must be sought out wherever they exist, and must be prevented from spreading further. The physician in his private practice must become preventive minded as well as therapeutically minded in his thinking of tuberculosis. He must use diagnostic tuberculin and the X-ray freely, and search diligently for the source when he discovers an infected patient. Conversely he must examine all the contacts of a known consumptive, and supervise the future health course of those he finds infected, lest they in turn become consumptives. The knowledge is available to control tuberculosis by epidemiological means. This end may be secured by application of this knowledge.

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The Teacher*

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THE problem of the prevention of infection should be ever foremost in the minds of all who would call themselves physicians. This has long been recognized as the primary step in the control of tuberculosis and it is toward this end that the workers in this field have been striving.

"Find the source," has for years been the shibboleth of those interested in tuberculosis work. Believing that, as a rule, tuberculosis is a disease which infects early in life, has a dormant or inactive stage and becomes activated later when bodily resistance is lowered by reinfection, or undue physical strain, or the combination of both, it behooves us to find the source of these first infections and control them if we are to eradicate the disease.

Conceding that one-quarter of the population of the U. S. A. are in school, and these of the age group who are the most susceptible to infection, it is only logical that we start our search for early infection with this group. This, we have done in the Mantoux surveys of schools. The source of infection of the positive reactors has been diligently sought for, and in many cases found. There is one source, however, that has been overlooked in many surveys—that of the teacher. With this in mind, and feeling that the incident of tuberculosis in teachers would be no less than in another group of the same age and employmental environment, we have a problem which confronts us that must be recognized and solved if progress is to continue. There are in the United States 1,062,976 teachers engaged in supervising the training of 30,415,928 youths. Daily contact, often intimate, greatly increases the hazard of infection if the teacher should be an open case of pulmonary tuberculosis. Does this occur? Would it be possible for our school boards to employ a teacher with far advanced pulmonary tuberculosis? The answer is, yes. It has occurred and is occurring now. Within the last two years, we, in our own small surveys have discovered three teachers who died within three months of the time they were taken out of school, all far advanced cases of pulmonary tuberculosis, positive sputum, persistant cough and intimately associated with their pupils. A brief survey of work among teachers in the Riverside Sanatorium district is as follows:

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Number of schools tested	149
Number of teachers tested	786
Reacted positive to Mantoux test	30.4%
(All positive reactors X-rayed)	
Findings:	
Adult demonstrable pulmonary tuberculosis	12
Positive sputum	8

From the above we have found the answer to the question previously asked. We do find active and open cases of pulmonary tuberculosis in teachers. In the light of the above findings, we cannot help but ask, have any of the children been infected; if so, how many? We have been fortunate in being able to choose as an example a case with a fairly ideal set-up.

A teacher, having some sixty pupils, was found to be a far advanced open case of pulmonary tuberculosis. The pupils were all of one age group. In the same school were three other groups of the same age and environmental surroundings except that their several teachers were in good physical condition. These latter were used as a control group for comparison. The exposure period to the infected teacher had existed for a period of six months. Our findings were:

Sixty-four pupils exposed to teacher with F.A."B" pulmonary tuberculosis, 42.6 per cent positive to Mantoux.

One hundred sixty-one pupils not exposed to above teacher, 11.2 per cent positive to Mantoux.

(Same school, same age group and home environment.)

Do we have the right to conclude that the tremendous increase in the incident of infection as shown by the positive Mantoux, was due to the contact with the open case of tuberculosis in the teacher? We feel that we do. What then, can we do to protect youth of our nation from a chance exposure in sending them to school? The answer is obvious; require each teacher to prove herself or himself not a menace to the health of the youth of our land, before a contract to teach is signed. That this can be done has been demonstrated in many communities where school boards have been contacted and the danger explained to them. As to the legality of this, our Minnesota Attorney General, Harry H. Peterson, has ruled, to quote, "The Mantoux skin test for teachers is a reasonable exercise of the police powers of the School Boards, if required for the purpose of safeguarding the health of the pupils of public schools." The Mantoux once being done, all positive reactors are X-rayed. If no evidence of active pulmonary tuberculosis is seen, the teacher is given a statement to the effect, which is filed with the employing school board.

Considering the ease with which this work can be accomplished, are we, the physicians, guardians of the health of the nation, going to stand indicted for lack of effort—or through perseverance take the next step forward in the fight to control the Great White Plague by demanding that all teachers prove that they are not a menace to the health of our children?

The Significance of Tuberculosis in the College Age Group*

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THE GREAT importance of tuberculosis among college students is well known to this audience. Their vulnerability is not due primarily to the fact that they are students or that they study in our colleges but is largely accounted for by the fact that they belong to an age group from which a high toll is exacted by tuberculosis all over the world. While adequate figures are lacking, a study of death rates by occupation, such as those compiled by Jessamine S. Whitney[1], suggests that students are somewhat better off in this respect than the vast number of young people who never go to college, a difference which is to be expected if due weight is given such factors as race, color, economic level and social status. It seems reasonable, therefore, to center the discussion on the peculiarities of the behavior of tuberculosis in the late adolescent and young adult group generally.

Considering this age group as a whole we should pay attention to the gradually changing trend of the disease as shown, for instance, in the recent excellent review by Dublin[2] of the experience among industrial policy holders of the Metropolitan Life Insurance Company. It adds to the background of our work to know that, in the 20-24 age period of this group, the tuberculosis death rate among white men (1926 to 1930) was only sixty-six per cent of that among women, despite the fact that the rate for the entire life span was considerably higher among men (136:100). The twenty years preceding 1930 brought a striking lowering of the mortality curve and, with this, an interesting change in the shape of the curve. The peak rate for white females shifted from the 25-34 age period back to the 20-24 period, while that for males shifted from 35-44 to 45-54. The rate among young adult negroes continues to be three to five times as high as that in whites of like age. These findings have added meaning in view of the fact that there is a parallelism between mortality rates and morbidity rates.

The behavior of the lesions of tuberculosis in adolescents and young adults is worth special study. In a number of ways it is decidedly different from that observed in childhood or in the age periods after forty. Fatal tuberculosis of the lungs is relatively uncommon before adolescence; thence it mounts rapidly to become the main cause of disability and death in early and middle adult life. At the onset of the disease at this age the lesion is usually small, freshly developed, and confined to one lung. Its appearance often is rather abrupt, and chest roentgenograms may have been clear a few weeks or months previously. There is a striking contrast, however, between the abruptness of the intrusion and the manner of the intruder. The menace of the lesion is concealed by the insidiousness of its symptoms, and the patient is seldom aware of its presence unless it is divulged by routine roentgen ray examination. Likewise, it is usually not discovered at this stage by the physician who performs only a stethoscopic examination. Most often the early parenchymal lesion is of a lobular pneumonic inflammatory nature. Unknown to the patient, it may undergo almost complete absorption, leaving a scar which cannot be identified in the living. But the reverse may also occur; i. e., the center of the lesion may slowly or quickly undergo caseation and liquefaction. Again the symptoms may be so slight or so vague that they go unnoticed. If such necrosis continues, the lesion sooner or later ulcerates into a bronchus and discharges its liquid contents which carry tubercle bacilli. In many cases this event, with its attendant symptoms, is the first subjective evidence of trouble, and even then the impression on the patient may not be lasting. These phases of development of the lesion, in young people especially, may succeed each other rapidly, but the rate in some cases is slow or there may be a lull of months or years during which the process is retarded or arrested by natural inherent forces called resistance.

Discharges escaping from the ulcerated lesion constitute a grave menace, since they practically always contaminate healthy parts of the lungs and thus propagate a few or many new lesions, each of which is endowed with the menacing properties of the first. The repeated or continued operation of this mechanism explains in most cases the advancement of pulmonary tuberculosis. The absence of striking symptoms until the phase of ulceration, excavation, and bronchogenic extension has been reached is the chief reason why few patients voluntarily visit a physician until the disease is in its second or third stage. Perhaps the most important thing to emphasize about tuberculosis in the college age group is that small innocent-looking lesions tend more often to progress at this period of life than at most other periods and that the progression, if it occurs, is more likely to be rapid. Even those which advance slowly or are temporarily arrested often give rise to chronic disabling disease in later years. In fact, there is good reason to believe that much, if not most, tuberculosis of old age dates back to lesions having their inception in youth. It is self-evident, therefore, that prompt recognition and control of a tuberculous lesion in a student may save him not only from immediately serious illness but also from the ravages of chronic disease long after he has left the university.

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*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, December 28, 1935.

If these are significant facts—and there can be no doubt of this in light of our present knowledge—then their implications for a practical and effective program of detection and control are clear. The principles to be recognized can be briefly stated as a set of reiterations and conclusions.

Conclusions

1. Tuberculosis is the most fatal disease at the ages when students attend college and university, especially female students.

2. The lesions often appear abruptly, are usually of a lobular pneumonic character, may be almost completely absorbed but have a striking tendency to progress rapidly to ulceration and excavation, the mechanism by which secondary lesions are propagated.

3. Symptoms, at the first appearance of the lesion, are seldom sufficiently impressive to suggest the need of medical attention. At this stage abnormal physical signs are slight or wholly lacking. The cure of tuberculosis is accomplished more easily, more surely, and more promptly in this early, non-ulcerative stage than at any other. For these reasons

4. Every student should have some form of X-ray examination of the chest at least once a year, and more often if he develops any of the vague symptoms which may attend tuberculosis. Roentgenograms are best for this purpose, but if these cannot be obtained, fluoroscopy should be relied upon. Careful use of the fluoroscope reveals most early lesions of clinical significance, but all suspicious or definite findings should then be confirmed by roentgenograms.

5. Some students with freshly developed, small tuberculous lesions may elect to continue through college and may escape serious consequences. However, there is no wholly dependable criterion by which such a fortunate outcome can be predicted. The practice of classifying freshly developed, though clinically latent lesions for observation only is hazardous, especially if observation waits for ulceration of the lesion and a positive sputum before treatment is advised.

6. The wise course is always to treat tuberculosis in view of the potentialities of the lesions, hoping thereby to avert serious actualities.

7. Therefore, I believe, any freshly developed tuberculous pulmonary lesion clearly demonstrable by X-ray in a person of college or university age should be treated as a dangerous lesion. The term, freshly developed, is meant to imply that the lesion appears to be of a lobular pneumonic type with or without cavity formation, and that X-ray examination six months or a year previously showed no such lesion. Other lesions, such as recent pleurisy with effusion, should be regarded seriously also, though the hazards may not be so great. Most of these patients should have a period of two to three months' bed rest, to be followed by sanatorium rest cure or its equivalent until arrest of the process is reasonably assured. In my experience, many of these early cases show tubercle bacilli sometime during the course of treatment if the minute sputa are examined regularly and carefully.

8. Students who, upon entering college, are found to have apparently older, partly fibrotic lesions may be classed as observation cases, and may be allowed to go on with their studies. Roentgenograms should be made every two to three months for a year or so, in order to confirm the impression that the lesions are, in reality, arrested.

9. In the Bellevue Hospital Nurses' Training School, where the average age of a nurse on admission is nineteen and where the enrollment is two hundred, a program, organized on these principles, has been in force for five years. The results to date are as follows:

a. All tuberculous leslons have been discovered in the early or "minimal" stage.

b. There have been no deaths from tuberculosis.

c. The disease has been arrested in all cases.

d. In no case has surgical treatment been required to bring about recovery.

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Discussion

(Remarks by Dr. Willard B. Soper, of the Department of Health of Yale University, on the paper by Dr. J. Burns Amberson, read before the American Student Health Association.)

Dr. Amberson has given a remarkably clear demonstration of the value of close following by X-ray of the nurses of Bellevue Hospital. Also he has very clearly shown the wisdom of immediate sanatorium care for practically every case with new soft pathology in the lungs. There can be no disagreement as to the value of his procedure.

Dr. Amberson's experience is directly applicable to similar types of pathology in young college students. However, one must not conclude that the findings in university students are always of new fresh pathology. Our findings during the five years at Yale University are perhaps of some interest.

Since the Fall of 1930, all students entering Yale University have had single X-ray films of the lungs. Up to June, 1935, the total number so examined was 7,578; comprising 4,188 undergraduate freshmen, and 3,390 students entering other departments, almost all of them graduate students and therefore in a definitely older group.

There are two elements in Yale findings to which I wish particularly to call your attention: age and race. Among the 4,188 undergraduate freshmen the number of cases diagnosed as adult pulmonary tuberculosis was only 8 to 1.9 per 1,000; while among the older group of 3,390 students entering all other departments there were 55 cases or 16.4 per 1,000. As to race, the total of 63 cases of adult pulmonary tuberculosis comprised 12 foreigners excluding one Canadian and one Negro. The presence of any large proportion of foreigners may, therefore, be expected to raise the number of cases disclosed.

As to the type of pathology, relatively few show the new fresh lesions described by Dr. Amberson. In most instances the pathology has the appearance of being old and fibrosed. Its development has not been observed and there is frequently no clue as to its age. It then becomes a matter of judgment as to what should be done. Of the 63 cases during the five years 15 were sent to sanatoria or to their homes for treatment. The remainder were regarded as having their disease sufficiently arrested to contine their work under observation by x-ray and otherwise, more or less frequently according to the pulmonary and physical condition.

Discussion

(Discussion of Dr. Amberson's Paper "The Significance of Tuberculosis in the College Age Group," by Kendall Emerson, M.D.)

My Rhetoric Professor taught that there were two requisites to good writing; first, never use a needless word; second, put an idea into every line. If we observed the second rule most of us would never get beyond the first line. Not so Dr. Amberson. His paper is a model for writers on medical topics, no superfluous words; crammed with the sound ideas which his wide experience has fostered. Only a venturesome critic would attempt to subtract from his conclusions or challenge the logic of his argument. I shall certainly not make the attempt especially as I am in entire accord with the views set forth.

Instead I may perhaps take a moment to mention two callateral aspects of the subject. Dr. Amberson has confined himself to its medical phase, I will speak of its economic and educational implications.

A generation ago, and before, there was very little of the sporting element in our search for tuberculous cases. A pebble tossed at random would be more than likely to hit one. All that has changed, the cases are no longer left to discover themselves. As Dr. Amberson has pointed out the hope for speedy cure lies in getting the early case under treatment. Moreover, the hope of eradicating the disease rests on discovering the occult case before he has become infectious and passed his disease on to his neighbors. As the percentage of such cases grows less the difficulty in finding them increases until today the methods of the detective are needed to run them to earth.

These facts show a direct economic bearing. It requires time, skill and money to locate and cut out of the herd the relatively infrequent, unrecognized, early case. Many healthy individuals must be examined to find one in whom the disease has gained a menacing foothold. Physicians, nurses, social workers, technicians and teachers must co-operate in the task. Relatives must be taught to lend their sympathy and intelligent approval of the processes involved.

In these hard times universities are faced with the necessity of stringent administrative economies. Prior to 1929 a number of them had undertaken a careful and systematic screening of their students for occult tuberculosis. Some have felt obliged to mark time or even retrogress in this effort because of seemingly more pressing needs.

In the congregate life of our colleges personal health ceases to be an individual matter. Be he a member of the student body or of the faculty one who is a health menace to his fellows must be segregated. This principle is not questioned in the case of other infectious diseases. If diphtheria appears all throats are cultured and suspects restrained from contact with others. Tuberculosis is a much more difficult infection to discover. Its insidious onset deprives it of the dramatic interest aroused by the more fulminating infections. Yet we must never forget that tuberculosis is still accounting for more deaths between the ages of eighteen and thirty than any other disease. From the point of view of economics it is essential for a college to turn out tuberculosis free graduates. Otherwise the educational investment is needlessly lost and in addition a tuberculous student may have innocently infected many of his associates.

With these facts in view, what is the duty of a college in facing the money cost involved in carrying out its share in the campaign to control tuberculosis? It seems to me the answer is obvious. It would further appear most reasonable to expect the student to bear at least a part of the added burden, for an intensive tuberculosis program adds an apparently disproportionate percentage to the total budget for preventive medical service. Against this, however, should be offset the economic saving represented by the probable discovery of one or more infections at the preventable stage, with the saving of a life or of potential years of disability and suffering.

One more word must be spoken on the educational value of a well developed college plan for the control of tuberculosis. Even with the improvement of health teaching in primary and secondary schools most boys and girls reach college with slender knowledge of personal hygiene and meager grasp of preventive medicine and community health. There is no other of the common infectious diseases which touches so completely all sides of these problems. If you avoid contact with the tubercle bacillus, you will have no tuberculosis. But how does one avoid such contact? If, despite all reasonable precautions some contact with the germ has occurred what measures will most probably prevent serious consequences? The answer is, protect your health by sanity and wisdom in habits of cleanliness, diet, sleep, work, play, rest and human relations. When you have learned this you have possessed yourself of a pretty fair working knowledge of preventive medicine and public health, but you have learned no more than you need to know to assure yourself protection against that arch enemy of youth, tuberculosis.

The educational value of a search for the positive reactors to the tuberculin skin test, the x-raying of the chests of all positives, and the observation and advice which these latter must receive are powerful arguments for the maintenance of an adequate case finding and follow-up tuberculosis program in every well equipped college.

Furthermore, the object of a college education is to fit men and women for better citizenship. This implies trained familiarity with the processes of government. Important among governmental activities are its public health functions. No better text can be found whereby to expound the theory and practice of public health than in the dramatic history of its fight to control the ravages of the universally distributed communicable disease, tuberculosis.

The Prevention of Tuberculosis*

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THE incidence of tuberculosis has been steadily falling in most countries so that it is not unreasonable to hope that it may soon lose its claim to the title "White Plague." The death rate from all forms of tuberculosis fell by 56.9 per cent in the United States and by 50.5 per cent in England and Wales in the first quarter of the present century. Credit must go chiefly to the public health authorities and although many factors contribute to this improvement most of them can be described as better social conditions.

In this paper, however, I propose to discuss the protection of the individual which is quite a different problem from that dealing with the protection of the community.

1. Contacts—The usual method of infection is by contact. When one member of a household is infected the others are definitely in danger of becoming infected. Infectious diseases are not all equally infectious and it is true that tuberculosis has a low grade of infectivity, but tuberculin tests and radiography have made it clear that many more people are infected than was formerly believed. When a child contracts tuberculous meningitis it is nearly always possible to find a consumptive member of the household, often an elderly relation with what was regarded as bronchitis. Acute tuberculosis arises from an intensive infection such as when a young girl nurses an advanced case in an ill-ventilated and dirty room. Continuous and long standing exposure to small doses of infection produces a chronic form of disease with few, if any, symptoms until an extensive fibrosis has developed. Diagnosis is usually made by radiography when the patient is examined either as a contact or because of some accident such as haemoptysis. In one family where the father was consumptive one son was found to be infected at a routine examination for life insurance. Thereupon, the two other sons were examined and in one case extensive fibrosis of both lungs with two cavities in the upper zone of the right was discovered although the patient felt perfectly fit and was at work and leading an active life.

The first step in prevention, therefore, is to find the source of infection. In order to do this every member of the household should be examined clinically and radiologically whenever a case of tuberculosis appears. The examination of contacts has two objects, one to diagnose the early case, so that by prompt treatment the patient has a really good chance of being cured and the second is to prevent the healthy from being infected by discovering and sending away the individual who is infecting the home. The second purpose is often overlooked although it is the more important of the two. One sometimes finds that only selected members of a household are examined, either the children, or those that are delicate or have a cough or some other symptom. By this means an occasional early case may be found, but the healthy are left in the danger zone to await infection.

2. Milk—In 1931 there were 34,102 deaths from the human type of tuberculosis and 1,716 from the bovine type in England and Wales. Bovine tuberculosis does not, therefore, play a big part in the problem of tuberculosis. Some authorities have suggested that the presence of a few tubercle bacilli in milk is actually beneficial as they tend to produce partial immunity. I cannot agree with this view, for I think milk should be as clean and pure as possible, but the danger of bovine tuberculosis has undoubtedly been exaggerated. Milk is always boiled in France and this is the best method of killing tubercle bacilli. Pasteurization does not lessen the food value of milk, but subsequent boiling does. It is important, therefore, not to boil pasteurized milk. The ideal, of course, would be to have tubercle-free herds.

3. Immunization—Attempts have been made to produce immunity or partial immunity by vaccination in one of three ways:

(a) By the injection of small numbers of virulent living bacilli. This produces a fairly good immunity, but it lasts only a short time so that the injections have to be kept up and there is a definite danger of causing active tuberculosis. This method is too dangerous to use in the case of human beings.

(b) By injecting dead bacilli. This is safe but any immunity that may be produced is totally inadequate.

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(c) By injecting living but avirulent bacilli. B. C. G. (Bacille Calmette Guerin) is made of bovine tubercle bacilli rendered avirulent by culturing on a bile-potato-glycerine medium and by subculturing every three weeks on potato-glycerine. After every ten passages on potato-glycerine it is subcultured on the bile-potato-glycerine medium. During the subculturing, which entails a large number of passages as time goes on, it is important to return the culture to the bile-potato-glycerine medium periodically in order to make it a "virus fixe."

If prepared according to the instructions of Calmette it does not increase in virulence when injected into the body, nor does it ever produce progressive tuberculosis in the human subject, although harmless retrogressive lesions may appear. Experiments have proved that B. C. G. does produce a considerable degree of immunity in calves, but further research is required to judge the amount and duration of protection in man. It seems that its effect does not last long but that at the height of its protection patients may be exposed to a reasonably large infection without developing active disease. By getting repeated small infections they possibly acquire a further degree of immunity. Statistics support the view that B.C.G. does afford some degree of protection in infants, and the method is extensively used in France with good results. It is by now clear that B.C.G. is a safe preparation, accidents following its use have been recorded but I know of no authentic case of active tuberculosis in man being due to B.C.G. Contamination has occurred with disastrous results but any substance or drug might become harmful if contaminated.

The method of procedure is to inject 0.1 mg. into the new-born infant, or the Mantoux negative children in an infected household. About a fortnight later a papular swelling appears at the site of inoculation and it may ulcerate with slight swelling of the local lymphatic glands. There is no constitutional disturbance and the local changes soon settle down. The infant is now allergic and shows a positive Mantoux test in 80 to 90 per cent of the cases, whereas if B.C.G. is given orally a positive Mantoux reaction occurs in only about 20 per cent. Most authorities, therefore, favor a the parentenal rather than the oral method of administration.

The death rate from tuberculosis has been steadily falling for all ages including infants except at the age periods of 15-25 in women. In England and Wales the decline in the death rate from pulmonary tuberculosis between 1901 and 1929 was 42 per cent for boys and for girls between 10-15, a 21 per cent decline for boys but none for girls of 15-20, a decline of 36 per cent for boys but an actual increase for girls of 20-25. There are probably many factors to account for the persistence of a high death rate from this disease in young adult women, but it is not without interest to note that the mortality curve suddenly rises at the beginning of the child-bearing period and drops at the end of it. Some function connected with sexual activity may play an important part in the spread of tuberculous disease. Ought we then to protect our young girls by some form of vaccination? It seems to me that these girls, if living in an infected household, are in more urgent need of B.C.G. than infants.

In certain acute cases or cases of recurrence of pulmonary tuberculosis it appears that the lesion is largely due to an allergic reaction. Physical signs and X-ray appearance may show a large area of the lung to be involved, but experience shows that most or even all may clear up. It is an inflammatory reaction produced by virtue of the allergic condition of the patient and when the inflammatory part has resolved a tuberculous focus remains and often breaks down into a cavity. Since these allergic reactions are often the starting point of a secondary tuberculous lesion and since they are especially liable to come during convalescence from pulmonary tuberculosis, it has been suggested that on leaving a sanatorium a patient should be treated by a course of tuberculin in order to render him a non-reactor even to a large dose of tuberculin and so prevent or lessen the danger of allergic reactions.

In my opinion research on the problem of immunization in tuberculosis is very important and should be encouraged and I feel convinced that some degree of protection can be obtained by it. But I think it is unwise to put too much faith in these methods of immunization. I regard natural immunity as of greater value than acquired immunity. The excellent work of the public health authorities in preventing or at least reducing the chances of a massive infection is a huge factor in the reduction of the death rate. If there is a patient coughing up tubercle bacilli it is infinitely better to remove him to some institution or to teach him to be careful about his habits rather than to try and protect his children and companions by giving them small doses of the infecting substances. At the best, acquired immunity is only relative and variable. It can be broken down by shortage of food, especially fats, fatigue and other means and one must not forget that active tuberculosis can only develop in an infected body. Prevent infection and tuberculosis cannot occur. It is now recognized that a previous infection as shown by a positive tuberculin test is not necessarily a protection. In some of the African mines it was found that those natives who did react to tuberculin were twice as likely to contract active tuberculosis as were the non-reactors. The change of environment and conditions of work broke down the resistance in those already infected, the amount of resistance they had acquired was insufficient to stand the strain and it was that small infection, not great enough to show its presence except by the tuberculin tests, that flared up into activity. On the other hand, those whose natural immunity was greater and who did not react to tuberculin were better able to withstand the change in the conditions and mode of life and were less likely to develop active tuberculosis.

Let us, therefore, develop our study of acquired immunity but bear in mind that the best method of preventing tuberculosis is to avoid the risk of exposure to massive infection.

The Control of Tuberculosis*

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NO PHENOMENON, bearing on the welfare of the human race, is of more importance than the decline in tuberculosis. In order to understand what has taken place it is necessary to go back and review the past, and call attention to some of the significant landmarks which have guided us on our way, to take note of the present and to attempt to present a rational plan for our future work.

Tuberculosis is as old as civilization. Man, domestic animals and birds are victims of the disease. Most of our interest centers about man and cattle and the latter as sources of infection are rapidly being eliminated through the destruction of infected animals and the more wide spread pasteurization of our milk supply. Ancient medical writers described the disease, recognizing it only in its advanced stages; hence the name consumption or phthisis. Little knowledge was added through the years until early in the last century when the disease changes in the body were described by a young French physician, Rene Laennec, who, at the age of forty-four years, was himself to fall a victim of the disease. This same brilliant scientist also gave us our first stethescope, the instrument which has enabled physical diagnosis of the heart and lungs to reach a much higher degree of accuracy.

About the middle of the past century a Viennese physician, Rokitansky, by careful post mortem studies showed that some evidence of tuberculous infection could be demonstrated in the bodies of practically all adults irrespective of the disease which had produced death. In addition to this, there was encountered evidence of well healed pulmonary tuberculosis. Brehmer, a German, thinking over the significance of this latter fact came to the conclusion that, if natural healing could take place in certain favorable cases of the disease, there should be some special forms of treatment which would aid in the curing of many more individuals and as a result there came his revolutionary pronouncement in 1853 that tuberculosis is a curable disease. Five years later he established at Görbersdorf the first lasting institution for the care of the tuberculous and one which, from a crude beginning, was to exercise the most profound influence on the treatment of the disease throughout the civilized world. In our own country Dr. Edward L. Trudeau immortalized his name through the establishing at Saranac Lake, in the Adirondack region of New York the institution which now bears his name, in the year 1884. The spread of the sanatorium movement throughout the United States has been a remarkable one and today there are some 80,000 beds provided for the care of the tuberculous.

In 1865 Villamin, a French Army surgeon, by animal inoculation experiments proved that the disease was transmissible. Following this came Pasteur's brilliant laying of the foundations of the germ theory of disease and in 1882 Robert Koch announced the discovery of the tubercle bacillus as its cause. In 1890 Koch found the substance tuberculin a product produced during the growth of tubercle bacilli in a glycerin broth culture medium. This substance was enthusiastically heralded as a cure for the disease and while practically a complete failure as a curative agent, it was destined to prove invaluable as a weapon in the control of the disease. Clemens Von Pirquet an Austrian physician found in the year 1907 that a person harboring tubercle bacilli within his body would react in a characteristic way to this product. He applied the test by scratching the skin and applying a drop of tuberculin to the scarified area. A positive reaction was manifested by an area of redness and swelling about this area forty-eight to seventy-two hours later. Shortly after this the Mantoux test was developed. This consists in the injection between the layers of the skin of a small amount of a dilute solution of tuberculin. The reaction is similar, but more intense than that produced by the Von Pirquet method, and is somewhat more reliable.

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Recently a highly refined tuberculin product has been brought out, known as purified protein derivative or P.P.D. which is highly specific in producing the reaction and is devoid of the many protein side reactions which may complicate the reaction when the older tuberculins are used.

In 1895 the x-ray was discovered and this has been so highly developed that today it has become our most indispensible diagnostic aid and our main reliance in instituting proper treatment. Indeed proper diagnosis and treatment as we understand the disease today are impossible without resort to its use. Physical diagnosis is good as far as it goes but we have learned of its limitations and no longer can we place the reliance upon it that we once thought we could, and it is the use of the x-ray which has taught us these shortcomings.

In 1904 the National Tuberculosis Association was organized, with its enlightened program for the control of the disease, the cardinal points of which are as follows:

1. Teaching that tuberculosis is preventable and curable.
2. Dissemination of knowledge concerning the means and methods of prevention.
3. Promotion of movements to provide clinics, camps and sanatoria.
4. Aiding in all efforts tending to prevent the development of the disease, such as better housing, creation of parks, play grounds, improved sanitary systems.
5. Co-operation with local, state and federal authorities with a view towards enactment and enforcement of anti-spitting ordinances and preventing the use of milk and meat from tuberculous animals.
6. Obligatory notification of all cases of tuberculosis to the proper health authorities.

That these fundamental principles are as valuable today as when they were first laid down is a tribute to the genius of the founders.

This association has enjoyed a tremendous growth and, with its valuable social contributions, has earned a well merited public esteem. It is financed almost entirely through the sale of Xmas seals and these little tokens have come to be almost inseparable from our Holiday Season.

A few years ago it was thought that infants and children acquired a different type of disease from the adult. The predominant characteristic was that the glands at the root of the lungs appeared to be the main seat of the disease, while in the adult destructive lesions of the lungs prevailed. The idea also became prevalent that infection in infancy was very deadly and one often heard it said that a child infected under one year was doomed to die, that under two years they generally died, and that from year to year the outlook while serious gradually became better. Now we know, thanks to the tuberculin skin test, and careful post mortem study, that so-called "childhood tuberculosis" is merely the first manifestation of tuberculosis and the prognosis is very good without secondary infection taking place. Not only this, but far more often than not the infection takes place without anyone becoming aware that it has occurred. These first infections are not limited to infants and children but may occur at any age in a previously non-infected individual so that the term first infection type of disease is much more appropriate than the term childhood type tuberculosis. Nor does there seem any good reason for attempting to separate those children who are merely infected from those showing definite x-ray evidence of glandular or parenchymatous lesions and calling the latter group the childhood tuberculous. Both groups harbor live tubercle bacilli and both are sensitized to renewed infection. The only difference between the two groups is one of degree and the time element may negate this difference as skin sensitization precedes any marked pathologic manifestation.

Secondary to the original implantation of tubercle bacilli, children may develop generalized tuberculosis usually manifested as a meningitis, destructive adult type disease of the lungs, or tuberculosis of the bones and joints and more rarely of the kidney. In the child generalized tuberculosis is almost invariably fatal while the adult type of pulmonary disease is much more serious than in the adult.

Not long ago we looked on the child who was ten per cent under average weight as being suspicious of having tuberculosis and these were the children who were sent to our fresh air camps, preventoria and fresh air schools. They were the pre-tuberculous children, a term, very poorly chosen, which should now be obsolete. This method, as a means of selecting our infected children, had no merit. Weight has practically no relation to first infection tuberculosis.

Next came the "contact" child; that is the child living in a home with an infected individual. This was a great step forward as a large number of our infected children are found in this group. It is interesting to note that the younger children are usually more heavily infected than the older ones, due to the fact that the source of contact usually suffers from progressive disease and particularly is this so if it is the mother who is ill, as her contact with her children is more intimate than that of the other members of the family. In this way a vicious circle is established. A tuberculous mother unknowingly infects her children. Of these some may die in infancy or childhood, while others may grow to early adult life only to fall a victim of the disease. Perhaps they are married and have children who in turn become infected. Obviously the proper thing to do is to break this vicious circle and we attempt to do this by removing either the patient or the children from the home at the earliest moment. This method while very useful has two serious drawbacks. It catches in its net many contacts who have not yet become contaminated while at the same time missing the large group whose infection is not brought about in the home and in most of whom the source of the contact cannot be ascertained.

This brings us to the modern method of case finding which is coming more and more into use. It consists in the application of the skin test and the x-raying of those who react positively. It is a procedure well adapted to the individual patient as well as to large numbers such as our public school, university or industrial groups. From a practical as well as a scientific standpoint this marks a revolutionary advance. Through its use we are better able to understand our local tuberculosis problem, to better and earlier select those who need supervision or active treatment and, from year to year, to measure with a reasonable degree of accuracy the results of our efforts at control. ,

Let us now turn to our record of mortality from tuberculosis. The year 1812 marked the first keeping of statistics of death in this country. From this time up to a few years before 1882 the year of the discovery of the tubercle bacillus there was little change in the death rate. With slight variations it ranged from 400 to 450 per 100,000 of our population per year. It seems fair to assume that some such rate could be projected backward through the years to the earliest recorded periods of civilization. We knew nothing more regarding the prevention or the treatment of tuberculosis than our ancient forebears. The slight drop which occurred in the few years prior to 1882 may be attributed to the effects of the industrial revolution which gradually brought about better living and working conditions, improved sanitary appliances, the awakening of a public health conscience and better personal hygiene. The effects of this social change have continued to operate up to the present time and will continue on into the future and to it must be attributed no mean share in the decrease of tuberculosis.

Since the year 1882 there has been a sharp and steady decline in the deaths from tuberculosis a rate of approximately 50 per 100,000 of population having been recorded for the past year. With the discovery of the cause of the disease the enemy had been brought into the open and became vulnerable to well directed attacks.

We often hear the statement that first infection with the tubercle bacillus serves as a protection against the development of the destructive adult type disease. As a former presidential candidate used to say in his campaign speeches, "Let us review the record."

In the year 1846 post mortem pathological studies showed practically one hundred per cent of the population infected. Along with this there went a death rate of 400 to 450 per 100,000. Well deserved was the name "Captain of the Men of Death."

Later in 1908 Von Pirquet through his studies of the tuberculin reaction showed that 65 per cent of the children at age fifteen and 90 per cent of adults reacted. The death rate was now 168 per 100,000.

What is the picture today? In the years 1926 to 1931 three thousand three hundred and six autopsies of the Mayo Clinic, in which some manifestation of tuberculosis infection was carefully looked for, revealed the evidence in only 62½ per cent. Skin tests carried on in this section of Indiana the past year show 10 per cent of grade school, 18 per cent of High School and 22 per cent of University Freshmen reacting while the adults only about 50 per cent react, and the local death rate for the past year was well below 50 per 100,000.

What does a comparison of these findings indicate? In the first place the assumption that first infection is a beneficial thing does not seem warranted by the facts. It is a strange immunity which allows the highest toll of death when the population may be considered as universally immune. The rates of a century ago should be low and our present rate high if previous infection conferred any reasonable degree of protection. All immune reactions are not protective and certainly in tuberculosis they are frequently destructive. The true fact seems to be that the presence of infection is very liable to sensitize to subsequent infections. One fact we surely know, one cannot acquire the destructive types of the disease without previous infection. *The only real protection in tuberculosis is to avoid the first infection.*

Secondly may we not assume that the phenomenon of dilution is operating in this as in all communicable disease. With each succeeding year the percentage of the infected portion of our population drops as also does the death rate and the morbidity. In addition to this the proportion of those ill who are hospitalized continually rises, so that more and more of those sick are withdrawn from circulation as it were and cease to menace the population at large. In this way the first infection group of our population finds it more and more diffilult to come into contact with one who can implant the destructive type of disease. As this process continues to operate it would seem that the old argument as to the relative importance of exogenous and endogenous infection will be decided in favor of the latter group, but here too the outlook is a favorable one for our infected group is steadily declining in numbers, while we are tending toward a better selection of this group and a more rational management of the infected individual during the late teens and early twenties.

Thirdly from a study of the films of our infected children we may conclude that the intensity of the first infection is decreasing, for more and more rarely do we find, particularly among white children, x-ray evidence of enlarged glands, or parenchymatous change. Thus we have the happy combination of a less widely distributed and a less massively infected group of first infection individuals.

This brings us to the recent attempts to popularize immunization of contact children with a weak strain of tubercle bacilli known as B.C.G. or Bacillus Calmette Guerin. In the light of our present knowledge the wisdom of such a procedure appears to be open to very grave question. It means the deliberate introduction into the body of living tubercle bacilli, although it is true that this strain does not, as far as it is known, produce disease. The vetenarians found out that a new born calf separated from its tuberculous mother immediately after birth did not develop infection. The medical profession was somewhat behind the vetenarians in adopting this salutary method of protecting infants. Naturally a child given B.C.G. is immediately separated from the tuberculous case and so gets the benefit of this protection. Also B.C.G. can be of no possible value to a child who has been previously infected. The true story of these vaccinated children will not be known until adult life is reached and I cannot help but feel that there will be many more cases of adult type disease develop among this group than the administrators of the vaccine will like to contemplate.

We have, at hand, a case finding method which is practical, readily available and to a high degree accurate. This consists in tuberculin skin testing and the x-raying of those who react. A more wide spread utilization of this formula in the future will lead to the discovery of many early cases of the disease, before great destruction of tissue has taken place, the duration of whose treatment will not only be very much shortened but the ultimate chance of cure much enhanced. In addition to this there should be a limited supervision over those who react in order that as far as possible they may be protected from becoming victims of the secondary types of the disease. Particularly should we be careful of our young candidates for our athletic teams. I have recently cared for three young boys with serious disease in whom a study of their films leads to the conclusion that the reinfection was in all probability precipitated by athletic over-strain.

Our methods of treatment have improved much in recent years. Not only is rest much more stressed than formerly but more and more are we resorting to some type of interference which will give added rest to the diseased lung and bring about the early closure of cavities. The application of these measures is prompt. We are not as much worried about whether the better lung will stand up if the worse lung is treated, as we are that the better lung will be involved in a progressive disease process if treatment of the worse lung is delayed. This change in attitude has not only resulted in the saving of many lives and shortened the course of treatment but has proven invaluable as a public health measure as prompt closure of cavities means early disappearance of tubercle bacilli from the sputum.

Nor are we limited in our efforts to bring about an arrest of the disease to the special treatment of the worse diseased lung. Various combinations of procedures may be applied to both lungs either simultaneously or in sequence and we are constantly becoming more adept in selecting and applying them.

More hospital beds for the tuberculous should be made available but we should keep in mind that we are dealing with a disease that is on a very definite decline. It is not so much new sanatoria that are needed as it is temporary emergency beds to take up existing waiting lists. There should be no delay in hospitalizing the tuberculous individual. Failure to accomplish this means added risk of the exposure of others while at the same time the chance of cure for the afflicted individual is jeopardized. Experience with an adequate hospitalization program in communities which have enjoyed such benefit shows that where sufficient beds are provided enough almost immediately becomes too much! Once the waiting lists are abolished there is a steady decline in the demand for beds. For this reason sentiment and ill directed propaganda should be guarded against and a well reasoned approach to our hospitalization problems should be made which will result in a program sufficiently flexible to be adjusted to our present needs and to care for our future needs in such a way as will reflect credit upon our leadership.

The search for the elusive specific cure should continue unabated, but if we apply assiduously our present knowledge we will probably be able to bring the disease down to the irreducible minimum without this desirable treatment having been found. This means continuous co-operative effort but as results become more and more apparent our enthusiasm should be stimulated and sustained at a high pitch.

Is it too much to hope that the day will come when a better educated public will demand strict quarantine of tuberculous patients during the phase of their disease when they are eliminating tubercle bacilli? While the time interval is longer between the infection and the appearance of disease, a case of open tuberculosis is probably as great a community menace as a small pox victim who runs at large.

Those who have dedicated their lives to this work can look back at the past unashamed, can contemplate the present with a reasonable degree of satisfaction, and can stand on the threshold of the future unafraid, and confident that in a not too far distant era the practical control of tuberculosis will have become a part of medical history.

The Fight Against Tuberculosis in Puerto Rico*

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Racial Characteristics and Living Conditions

THE Puerto Ricans are not one race, but two. According to the United States Census of 1930, about three-fourths of the Puerto Ricans are white people of Spanish stock, while one-fourth are colored, mostly mulattoes. Pure-blooded Negroes do not make more than six per cent of the population, while Indians, or even traces of Indian blood, are not to be seen anywhere on the island.

The island's population of 1,600,000 inhabitants live on a strip of land 100 miles long by 36 miles wide, making Puerto Rico one of the most densely populated countries in the world.

Over fifty per cent of the people are extremely poor. In a study of the San Juan slums carried out in 1933, it was found that 69.5 per cent of 3,500 families were living on incomes of less than two dollars per person per month, while in 43 per cent there was no definite family income because of sickness or lack of employment. In 20 per cent of these families there were four or more people sleeping in one room. In many cases as many as ten people slept in one small room with a floor space of about ninety square feet.

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*Prepared especially for the Tuberculosis issue of The Journal-Lancet.

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Epidemiological Factors

There is one factor in the epidemiology of tuberculosis in Puerto Rico which is found in very few other places. I refer to hurricanes, two of which have visited us in the past seven years. In a community of high tuberculosis incidence like ours, a stormy wind blowing at 150 miles an hour can determine in a few hours the trend of the mortality curve for a number of years to come. Its first effect on the tuberculosis death rate comes from the death of large numbers of far advanced cases who are unable to stand the privations, physical strain and mental anguish which follow in the wake of such a catastrophe. We have always a sharp rise in tuberculosis deaths the year following a hurricane. One of our most recent cyclones occurred in September, 1928. As a result, the tuberculosis mortality rate of 1929 was 19 per cent higher than that of 1927. In 1933, the year after the last hurricane, there was an increase of 22.5 per cent in tuberculosis mortality as compared to the 1931 rate. The tuberculosis death rate at this time was 337 deaths per 100,000 inhabitants, the highest ever recorded on the island.

The second effect of a hurricane on the tuberculosis death rate of the following years comes from the increased physical strain and greater privations that follow the storm. The third effect comes from increased overcrowding, which always means greater opportunities for contagion. The hurricane of 1928 destroyed 250,000 dwellings, causing two or three familes to huddle where only one lived before. Such conditions brought each case of tuberculosis in close contact with many more people, occasioning an increase in the incidence of the disease, and preparing the way for a rise in the mortality curve of the next few years. Thus, although the second and third years after a hurricane show a considerable drop in mortality, the death rate does not follow a steady downward trend during the next few years, but remains at a comparatively high level.

Tuberculosis is the first cause of death in Puerto Rico, constituting about 13 per cent of the total number of deaths from all causes. The average death rate during the last five years was 294 per 100,000 population. Our tuberculosis mortality reaches its peak between the ages of 25 and 29 for both sexes; it is 17 per cent higher in women than in men, and 19 per cent higher in the colored than in the white race. The urban mortality is 84 per cent higher than the rural.

Non-pulmonary tuberculosis is comparatively rare. The bone and joint forms appear to be at least as rare as in the United States. This may be partly due to the widespread habit of boiling the milk to prevent souring.

In spite of a statement made in the 1935 edition of "Diagnostic Standards," a publication of the National Tuberculosis Association, to the effect that the acute, childhood type of pulmonary tuberculosis is not uncommon among Puerto Rican adults, tuberculosis among Puerto Ricans is usually chronic, and of the same anatomical characteristics as that found among the white adult population of the United States. Childhood type tuberculosis among Puerto Rican adults is distinctly rare. This we have proved in two recent studies, one of them based on X-ray evidence from one thousand cases, and the other on anatomical evidence from some 800 autopsies.[1] That the island is a highly tuberculized community has been shown by several tuberculin surveys covering people of all ages. Ninety-four per cent of adults from 20 to 30 and 98 per cent from 30 to 40 react to the intradermic tuberculin test. Among children, 51 per cent under ten and 79 per cent from ten to fifteen are reactors.

The fact that our tuberculosis mortality is five times higher than that of the United States must not be ascribed to racial susceptibility, but to the conditions of extreme over-crowding and poverty under which a large proportion of the population live, and, until recently, to the lack of sufficient facilities for the hospitalization and treatment of the open case.

Hospitalization

Having thus touched briefly upon the main epidemiological factors that determine our high tuberculosis mortality, we can now outline the means through which we are facing the problem.

Each one of the measures that are ordinarily put into effect in any campaign against tuberculosis has been carefully pondered by us. Having a huge problem to contend with and limited funds at our disposal, we must try to avoid experimenting. Nor can we copy too much from other people. Our anti-tuberculosis measures must have been found to be effective by others; but they must meet the peculiar conditions of our community.

It seemed clear from the start that the hospitilization of the open cases was the surest means of halting the spread of the disease. Education of the public, of course, is important; but if we must choose between hospitalizing an indigent case with tubercle bacilli in the sputum and educating his family, we consider that hospitilization is the better measure. The reason for this we found out soon after we opened our first tuberculosis dispensary. The visiting nurse, nicely equipped with educational pamphlets, prophylactic material and a well learned speech on the value of good food, bed rest and fresh air, would go into the home of an advanced case to find the patient living in one small room with a large family, including perhaps six or eight children. Under such conditions, no amount of verbal or written instructions can possibly save the contacts from the danger of acquiring the disease. Advice about good food, absolute bed rest and strict separation may sound ridiculous when imparted to a family of ten crowded in a one-room hut, with the breadwinner of the family unable to earn a living. We still have great faith in educational measures; but we have learned their limitations among certain classes of people.

There are those who claim that early hospitalization of the minimal, sputum-negative case is of greater importance than that of the far advanced, often incurable invalid. That may be so in other communities; but not in ours, where extreme over-crowding and poverty make each open case of tuberculosis a public danger. We quite understand the importance of preventing a closed case of tubercluosis from becoming open; but we feel that, having on file in our Health Department nearly one thousand applications for the hospitalization of sputum-positive cases from the worst slums in the island, we cannot afford to distribute our available beds among less urgent cases. In our tuberculosis hospitals, therefore, we are giving preferent attention to the admission of open cases. Some day we shall come to the stage where we can afford to build sanatoria for the minimal cases; but before we do that we must have made ample provisions for the care of the very dangerous open case from the slums.

For practical purposes, we like to divide our positive cases into three categories, each demanding a different disposition:

1. Those whose sputum can be converted into negative by collapse therapy, and who need only a short period of hospitalization. The effective treatment of these patients requires pneumothorax clinics conveniently situated at short distances from their homes, careful follow-up and, in a number of indigent cases, the paying of transportation expenses to and from the clinic.

2. Those on whom collapse therapy is ineffective, but who can be kept in their homes under supervision, with but little danger to the family or the community.

3. Those careless, persistently ignorant and often indigent open cases who are not amenable to collapse therapy and who must be kept hospitalized if the community is to be effectively protected. It is this last category, by no means a small proportion of cases in Puerto Rico, that we are apt to neglect in our enthusiasm for collapse therapy as the panacea for all troubles of the tuberculosis worker. These patients require effective institutional isolation for the rest of their lives. They are comparable to leper patients in that they are always a source of contagion; but they are far more dangerous to the community than any leper.

No anti-tuberculosis campaign can be complete until provision has been made for the effective and permanent isolation of every one of these patients in institutions.

Tuberculosis Dispensaries

Tuberculosis dispensaries were one of the first anti-tuberculosis measures established in Puerto Rico. They have been functioning as Health Department institutions since 1924. Tuberculosis dispensaries without hospitals in a community like ours are, however, of little avail, except as educational agencies for the public at large. The great benefit derived from the first tuberculosis dispensaries was the stimulation of interest in the tuberculosis problem. They were training centers for a number of tuberculosis workers, served to locate cases, to find out facts about the tuberculosis situation, and to put these facts before the public. Little could be done for the cases once they were discovered, but this made very evident the need for more hospital beds, and paved the way for a more effective campaign.

Soon after the establishment of the first tuberculosis dispensaries, public health units were organized in Puerto Rico, and the tuberculosis service became part of the work of the unit. The medical health officer in charge of each unit also does school medical inspection and conducts prenatal and baby clinics, besides being responsible for the work of the sanitary inspectors in his district. There are now twenty-seven public health units on the island, covering fifty-five municipalities, with a staff of over thirty full-time medical health officers and 150 visiting nurses who devote about one-fourth of their time to tuberculosis work.

Concerning clinic promotion, unless the patient is under pneumothorax treatment we do not urge regular attendance at the clinic. We believe that the tuberculosis patient needs rest, and that no useful purpose is served by compelling a patient with fever to leave his bed and walk long distances to the clinic every one or two weeks so that the physician "may take a look" at him and prescribe a tonic or an expectorant. It does not seem consistent to preach about the need of absolute bed rest in active tuberculosis, and then to urge patients to engage in frequent trips which often involve considerable physical exertion. Once the physician has prescribed absolute bed rest, the nurse is definitely forbidden to invite the patient to the clinic. In case of an emergency, the physician will visit the patient in his home.

We save our clinic promotion efforts for the contacts. In this we are very insistent. Every contact must be examined at least every six months, and much oftener if showing suspicious symptoms. Suspicious cases where the diagnosis cannot be settled by ordinary physical examination and laboratory analyses are referred to the nearest Anti-Tuberculosis Center for fluoroscopic and, if necessary, X-ray examination.

The function of the visiting nurse in our scheme of work is purely educational. The avoidance of the spread of contagion in the home is her chief concern. Clinic promotion is just one of several means by which she strives to avoid the spread of contagion. If she makes clinic promotion her only concern, she is not fulfilling her obligations. The test of her efficiency is to be found in the degree to which families under her care practice intelligent precautions to prevent contagion and active disease.

Clinics for Collapse Therapy

We are using pneumothorax extensively in our tuberculosis hospitals. For the present, we are applying it only to moderately and far-advanced cases, and we give preference to those having positive sputum. The problem of the ambulatory case under pneumothorax treatment we have attempted to solve by establishing collapse therapy clinics, of which we have organized one in each of the eight municipalities having the highest tuberculosis mortality rate. We call these clinics "Anti-Tuberculosis Centers." Each one is equipped with a fluoroscopic unit, and most of them have complete X-ray plants. The personnel consists of one physician with at least one year's experience in tuberculosis hospital work, two graduate nurses, one or two social workers, clerk and janitor. Besides applying pneumothorax to ambulatory patients, the Anti-Tuberculosis Center serves as a consultation clinic, where difficult cases may be sent by the physicians of the public health units for diagnosis and advice as to treatment.

We try to keep our patients in the hospitals only until the sputum has become negative. When three consecutive specimens of sputum are negative to the concentration test, the patient is discharged, and referred to an Anti-Tuberculosis Center, if under pneumothorax treatment, or to a public health unit. Every time a patient is discharged from one of the tuberculosis hospitals, the chief of the public health unit located in the district where the patient resides gets a notice from the director of the hospital giving the future address of the patient, so that the nurses of the unit may visit him.

For those sections of the island that are too distant from the Anti-Tuberculosis Centers, especially the rural communities of the interior, we have a travelling clinic in an especially made ambulance equipped with a complete X-ray plant, including fluoroscope, developing tank and running water. The personnel of this travelling clinic consists of one physician with experience in pneumothorax and fluoroscopic work, an X-ray technician and the chauffeur. The clinic follows a definite itinerary, and serves the same purposes as the Anti-Tuberculosis Centers, i.e., a consultation center for the benefit of the local physicians, and a collapse therapy clinic, where pneumothorax refills are given.

In our scheme of anti-tuberculosis work, the functions of the tuberculosis dispensary are educational and diagnostic. Those of the Anti-Tuberculosis Centers and the travelling clinic are mainly diagnostic and therapeutic. Collapse therapy is the only form of treatment given to ambulatory patients in these institutions.

Preventoria

What about the usefulness of preventoria in such a community as ours? We had two. We recently closed one. In this last institution we took children of pre-school age who were in contact with open cases of tuberculosis, and kept them there for a few months. They gained weight, which they speedily lost as soon as they went back to their very poor homes. Our institution being small, we would often take to the preventorium one child out of five in a family, leaving the rest exposed to contagion. We were expending all the money of the local anti-tuberculosis association, and some government funds, in caring for one hundred children in the course of a year, while thousands of other children went without any protection. We found, moreover, that it cost us just as much to support a well child in a preventorium as to support a tuberculous patient in a hospital, and decided, therefore, to convert the preventorium into a sanatorium for tuberculous children, thus affording protection to many families where the sick child was a potential source of contagion.

Taking the child away from the home to protect him from contagion is an expensive and impractical procedure. It is far easier, more effective and less costly to send away the focus of contagion, leaving the rest of the family at home. In the cases where the source of contagion has died or is away from the home, the need for preventorium care is still more irrational. Tuberculous infection tends to remain dormant in children for many years. If protection of the infected child is to be effective, it must not be limited to a few months of institutional care. It must extend over a period of years, reaching into adult life, since most childhood infections that light up do not become activated until the age of puberty or thereafter. This, provided we accept the theory that most cases of adult type tuberculosis are of endogenous origin. If we do not, then preventorium care becomes even more irrational.

If we decide that the protection of the infected child requires intelligent supervision and special care over a long period of years, then we cannot think of institutions . We must think only of the home. "Make every home a preventorium" might conceivably be the slogan of future tuberculosis workers. By keeping the home free from foci of contagion, raising its standards, educating parents and affording facilities for systematic clinical supervision of contacts we could probably achieve more in the prevention of tuberculosis than has been achieved by all the preventoria of the past and of the present.

Recent Achievements and Plans for the Future

At the request of the present Commissioner of Health, Dr. E. Garrido Morales, the local Federal Relief Administration undertook in 1934 the construction of four tuberculosis hospitals with a total capacity of one thousand beds, thus increasing our hospital bed capacity from 500 to 1500 beds in a single year. A vigorous campaign for the collection of funds to equip these hospitals resulted in public contributions and donations amounting to $65,000. The Insular Legislature then lent its co-operation by passing a lottery law with a provision that sixty per cent of the net income of the lottery would be devoted exclusively to the control of tuberculosis. The funds thus assigned were sufficient to complete the equipment of the new hospitals, to provide for their continued support and to organize the Anti-Tuberculosis Centers of which mention has already been made. Behind all these accomplishments have been at all times the persistent efforts and enthusiasm of Dr. E. Garrido Morales, the present Commisioner of Health of Puerto Rico, who has given much of his time to the solution of the tuberculosis problem on the island.

As to our plans for the future, there are certain very definite things that we want to achieve. We must have a law giving the Commissioner of Health the power to procure the forcible hospitalization of those open cases of tuberculosis who constitute a menace to the community, but who refuse to be hospitalized. We must have a

Tuberculosis Hospital at Ponce, Puerto-Rico. Capacity, 350 beds.

law that will make it obligatory for all persons working with children, such as school teachers and other school employees, to submit to an X-ray examination of the chest at least once a year. Such examination should be made and paid for by the Health Department or the Department of Education. We need a law that will give authority to the Commissioner of Health to procure by force, if necessary, the examination of any person, who, being suspected by a Medical Health Officer of constituting a focus of contagion, will refuse to be examined. We must organize short courses of lectures and demonstrations on the diagnosis and modern treatment of tuberculosis for private practitioners, and especially for those physicians who are employed by the municipalities to look after indigent patients. We must intensify our educational campaign, giving special attention to school teachers. Through the Commission for the Prevention of Tuberculosis in School Children, a semi-official organization which has been very active during the last few years, we are planning to organize an extensive case-finding survey among children of high school age.

B. C. G.

We are not using B. C. G. in Puerto Rico. For this we have been censured. Some of our colleagues who read the enthusiastic reports of the European medical journals on Calmette's vaccine cannot understand why all our children are not yet vaccinated. We have pondered the matter very seriously. One of the ablest men in the Health Department, Dr. O. Costa Mandry, Director of our Biological Laboratory, made an extensive tour of Europe last year and requested the opinion of the leading phthisiologists of several countries regarding B. C. G. In France and Spain they praised the vaccine while in England they were very pessimistic about it. Dr. Costa and myself later wrote to about fifty well-known authorities in the United States, and put this question before them: "Do you believe that the time has come for health departments to engage in the application of B. C. G. to large numbers of children as a public health measure?" The replies we got ran all the way from an absolute "no" to an enthusiastic "yes." The great majority, however, had their doubts, and did not commit themselves very definitely one way or the other. Such inquiries, and the study of the abundant literature on the matter, lead one to reach at least two definite conclusions: First, the B. C. G. vaccine is still very much in the experimental stage. Second, its use in well-controlled experiments is to be commended; but its indiscriminate use in large numbers of children who cannot be properly followed up does not seem wise at present.

We have followed with great interest those studies, such as that of Park, Keretszuri and Mishulow in New York, and recently the work of Aronson in Philadelphia, where an honest and well directed effort is being made to determine the real worth of the vaccine. We may decide to use it in the future; but, whether we do or not, we shall pin our faith on the well-known and thoroughly-tested measures outlined above.

Men's Pavilions, Tuberculosis Hospital at Rio Piedras, Puerto-Rico. Capacity of the Institution, 800 beds.

The Importance of Thoracic Cautery in the Management of Pulmonary Tuberculosis*

Professor W. Unverricht†
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THE anatomical healing of a tuberculous lung with pneumothorax is dependent upon the completeness of the lung collapse hence it is always the aim to convert an incomplete pneumothorax into a complete one. I will here discuss only that method of intrapleural cautery which permits the removal of disturbing growth. The apparatus consists of an optical device similar to a cystoscope and a cautery. Both of these are introduced by a cannula, through the thoracic wall into the thoracic cavity. The adhesions can be cauterized under control of the eye. This is chiefly for cord or membrane-like adhesions of the thickness of the wrist joint or a little thicker. Broadly attached adhesions should not, in my judgment, be approached by this method instead submitted to other surgical measures (partially plastic or sealing).

The question of cauterization becomes trenchant only when pneumothorax exists from three to four months because many adhesions desolve spontaneously or become so ischemic and fibrous by stretching that the danger of cauterization is considerably lessened. Only the strands that hinder an effective pneumothorax should be treated. Long stretched out fine, weak ones generally are not cauterized. Long, slender strands are separated in the fibrous part close to the thoracic wall. Thicker, broader based or those not entirely bloodless, according to the suggestion of Jacobeus, are cauterized along the costal insertion. One cauterizes further into the layers of the endothoracic along the notched line formed in response to the pull of the adhesion. This cauterization along the costal insertion into the chest wall itself, however, is generally used only with rather broad and short adhesions. Otherwise one cauterizes near the chest wall or in the base without producing unnecessarily large connective tissue destruction. First with a weakly glowing, the cautery scarcely showing red, a coagulation zone is made and then increasing the cutting heat the area further cauterized. I have employed cold cautery just as Jacobeus did in earlier years, but see in it as did Jacobeus, no advantage. The duration of the operation becomes lengthened at all events through the use of cold cautery; bleeding is in no way lessened by its use, for accidental bleeding has led to halting the operation in the case of various authors. With the usual galvano-cautery I saw in earlier years occasional single drops of blood and in recent years not even these. I advocate a simple apparatus, since it is not the apparatus which is of prime importance but the hand and brain of the doctor using the apparatus. This view is taken by most doctors in Germany with much operative experience. The technical handling of adhesions always raises a barrier, which may be crossed neither with cold cautery nor with usual cautery, if one wants to avoid large injury. The duration of our procedure consumes ten to sixty minutes (average of all our cases 25 minutes including anesthesia and maintenance). Then also the length of operation is not a matter of indifference to the patient. An intrathoracic anesthesia of the costal insertion is possible through injection of average amount novocaine solution by means of a needle led through a flexible cannula under guidance of the thoracoscope. I seldom use this anesthesia, however, and get along with a previous dose of a light analgesia. In appropriate cases either a light avertine or evipan narcosis is given. I have never seen operation accidents. Frequently there develops skin emphysema which was spontaneously resorbed after a few days; once there occurred a Horner's symptom-complex. Transitory marginal exudates were visible by x-ray, larger exudates have developed 322 times, of which 97 were febrile. The great majority of these soon recede. In late years I have seen only a diminishingly small number of larger exudates; whether this is due in part to our prophylactic intrapleural oil injection, I could not decide, but assume so. The development of empyema was observed 33 times, i.e., about one per cent of our cases.

There were 3,231 intrapleural cauterizations with the following results occurring directly after or within the next eight weeks after operation: 2,415 cauterized with destruction of all interfering adhesions resulting in a complete or effective pneumothorax in 85 per cent; 826 cauterized with only partial removal of adhesions and only an effective pneumothorax in 34 per cent.

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*Prepared especially for the Tuberculosis issue of THE JOURNAL-LANCET.

†III Medical University-Polyclinic.

This calculation was arrived at through the consideration of the patient's condition two years after pneumothorax treatment, and is not concerned either with the pathologic-anatomical form of the process nor the various social levels of the sick. We have, therefore, in the thoracic cauterization method which substantially enhances the results of incomplete pneumothorax. Under the proper indications and in skilled hands it is an effective aid to incomplete pneumothorax cases.

Tuberculosis Insusceptibles*

An Epidemiological Note

H. W. Hill, M.D.†
Dundarave, B. C.

IF A LARGE group of children one year old be considered in the light of all that we know concerning their future histories as to measles and as to diphtheria we shall find that about ten per cent show as *insusceptibles* to diphtheria, perhaps five per cent as *insusceptibles* to measles.

The same group, about twenty years later, will show the same figures, but inverted—ten per cent only, now, are *susceptibles* to diphtheria, perhaps five per cent *susceptibles* to measles.

We know, too, what inverted the figures—in measles most of the 95 per cent "native" susceptibles have become permanently immune to measles through *attacks* of measles; in diphtheria most of the 90 per cent "native" susceptibles have become at least temporarily immune through *sub-infection;* i. e., they have now an immunity achieved without disease, gained by picking up here and there casually, *small* doses of infection, usually from diphtheria carriers. Only a very few of the group owe their immunity to recovery from attacks of diphtheria; a few to artificial inoculation.

What has been the tuberculosis history of this group during that twenty years?

We know the group has shown during that time a number of tuberculosis deaths, a number of existing active cases, a number of X-ray lesions and a large number of tuberculin reactions—all indicating fairly widespread tuberculosis infection of the group.

We know that very few of the group can show tuberculosis immunity acquired through an attack, such as most measles insusceptibles do; or through sub-infection by carriers as do most diphtheria insusceptibles; or through artificial inoculations, as in smallpox. Yet the high incidence of tuberculosis infection on the group and the low incidence of tuberculosis disease surely indicate some factor making a difference between those who contracted the disease on infection and those who did not. What is that factor?

Before offering an answer to that question, can we estimate for the group as a whole its percentage of tuberculosis insusceptibles as we have done for diphtheria and measles?

Suppose our 20 year old group were to be completely exposed to measles—we know 90 to 95 per cent would refuse to contract it; suppose the group similarly were exposed to diphtheria—again we know 90 per cent would refuse to contract the disease. Suppose the whole group were thoroughly exposed to tuberculosis—what would happen?

Of course no such wholesale exposure of any whole age-group of a whole population can occur—but cross sections of various age groups can be studied as contacts of infective cases—and this has been done in tuberculosis many times.

A recent contribution (with a review of some previous findings) to the question of incidence of infection with tuberculosis amongst family contacts and the disease resulting therefrom (Temple, A., of the Royal Edward Institute, Montreal; Can. Med. Assn. J., Nov. 1935. 33,597) indicates that not more than 30 per cent of those thus intensively exposed showed disease, either active or latent, by physical or X-ray examinations, continued over a number of years.

We may conclude that our hypothetical group 20 years old would show about the same figures or less. In any case Temples figures show the result of intensive exposure on mixed age groups.

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†Formerly Epidemiologist to the Minnesota State Board of

such as compose all populations, and the figure of 30 per cent susceptibles in the whole population agrees with other estimates very well.

Can we account for insusceptibles to tuberculosis if "inherited immunity" be rejected, and such immunities, through attacks, sub-infections, and artificial inoculations, as are active in other infectious diseases, can be eliminated as not sufficiently active in tuberculosis to account for the large number of tuberculosis insusceptibles satisfactorily?

We are driven, the writer submits, in tuberculosis to that hypothesis which offers to explain, in measles, in diphtheria and in poliomyelitis particularly, those insusceptibles who are insusceptible throughout life, *despite thorough exposure;* namely, that the potentiality for making immunity on infection which they possess is so high and so rapid in development that on infection with *any* dose, *large* or *small*, immunity is achieved before the disease can appear. The potentialities of the *susceptibles*, on the other hand, develops more slowly; in some cases also inadequately; so that disease results or even death. Such lower potentialities may achieve immunity without disease through *small* doses of infection, if and when such *small* doses are available; but only a high potentiality can achieve immunity without disease in the face of *large* doses of infection, such as close continuous contact with infective cases would insure.

Bronchitis or Tuberculosis? *

Munford Smith, M.D.[†]
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THE TITLE of this paper is suggested by the frequency with which this question arises, and in an attempt to aid in the answer thereto lies its justification.

Before the development of roentgenology and in that period when the physician had to rely to a great extent on the history given him by the patient and the evidence elicited by him on physical examination, there were certain generally accepted rules that were considered invaluable in the differentiation of tuberculosis from all other acute and chronic diseases of the respiratory tract. With the development of that diagnostic method and its co-ordination with physical and laboratory findings, it has been found that these differential diagnostic points are frequently in error. However, there is still a tendency to dismiss too lightly conditions which simulate or are simulated by bronchitis.

The experience upon which this paper is based has been obtained at Barlow Sanatorium, a philanthropic institution for the treatment of patients who are ill of the curable stages of diseases of the lungs, in that economic class between the indigent who readily receive aid from public institutions and that group who can afford care in sanatoria run for profit. Because this institution provides care for those who are worthy of financial aid, at approximately one-half of the actual cost of care, and because the number of applicants exceeds the facilities that are available, it is required that those seeking admission be examined at the Sanatorium.

In considering approximately eight thousand such examinations with two thousand admissions, we have been able to determine in a large number of patients whose condition has advanced from what was probably a readily curable lesion when they first consulted their physician, to a more serious one at the time of coming under our observation, the source of error in diagnosis which contributed to this unfortunate situation.

While in our experience errors of all kinds have been made, and tuberculosis has been confused with all other chronic and acute diseases of the respiratory tract, one of the most frequent ones has been the explanation of symptoms, for which the patient consulted his physician, on a basis of an "acute cold" or bronchitis. Frequently a diagnosis of tuberculosis is made when it does not exist, but as a rule this is not of as serious moment as when the reverse situation is true. Likewise in spite of excellent diagnostic facilities and training, the members of the staff of this institution have not been infallible, and it should be understood that the purpose of this paper is not to claim perfection on the part of ourselves, but rather to bring to the attention of the man, who does not have our advantages, the risk of too lightly considering an apparently trivial illness without serious consideration of the possible importance of signs of inflammation within the respiratory tract.

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*Prepared especially for the Tuberculosis issue of THE JOURNAL-LANCET.

[†]Barlow Sanatorium.

Because the vast majority of physicians do not have the facilities for roentgenological examination of their patients, that method of diagnosis will be mentioned only coincidentally. For the purpose of this paper there will be considered only history and evidence on physical examination of the patient. No attempt will be made to explain the pathological anatomy or physiology of either tuberculosis or bronchitis, and the technical question of whether or not such a disease as chronic bronchitis exists will not be considered.

The type of patient who most frequently causes difficulty in diagnosis is the one who consults a physician because of a cough which does not clear up as promptly as he would desire, and who on examination is found to have little or no elevation of temperature, in whom on auscultation there is found to be present some musical rales, and if any area of abnormality is suspected, it is found to be in the lower part of one or both lungs, rather than at the apex where tuberculosis most usually occurs.

While the history of illness is of importance, it is of value only if the patient gives it with accuracy, and even then it may often mislead, particularly if the examining physician accepts without question the patient's interpretation of events. Probably no sanatorium physician has ever heard any patient attribute the flareups that characterize tuberculosis to anything but a "cold." Likewise the absence of night sweats, pleurisy, failure to lose weight and strength, are not of diagnostic value, since the patient in the curable stages of tuberculosis frequently experiences none of these phenomena.

Up to a few years ago the presence of an elevation in temperature was thought to be necessary to diagnose active tuberculosis, and there was no great hesitation on the part of many competent men to express an opinion that a demonstrable tuberculous lesion was inactive in the absence of such symptom. Today, following the experience of many competent observers that patients may have an advanced stage of tuberculosis in an active state with no manifestation of temperature with the ordinary observation, or with an elevation of only a fraction of a degree when the thermometer is allowed to remain long enough to register, there is much hesitation in ascribing to the lack of this symptom any great diagnostic importance.

Likewise there are few today who attribute blood spitting to a broken vessel in the throat, or to a nose bleed, and it is rare that we see a patient in whom this symptom has occurred whose illness has been lightly dismissed by his physician, and the general attitude toward that occurrence is that it is not necessary to prove it to be of serious consequence, but rather that the burden of proof is on the one who would minimize its importance. This proof can not be obtained without thorough study and an adequate period of observation of the patient.

However, two factors in the hypothetical case above described lead to many errors, the site of the lesion in the lower part of the lung, and the presence of musical rales. The latter symptom is one that for some reason before the widespread utilization of roentgenograms was thought to be peculiar to bronchitis, principally, I suppose, because this type of rale is heard all over the chest, and was thought to originate in a bronchus of large size.

This sign can be produced by obstruction anywhere along the respiratory tract and arises from interference with the course of the air stream passing through a hollow tube, exactly as a whistle can be made by inserting into a reed a wooden plug which partially obstructs the lumen.

In inflammation of the bronchi the congestion of the mucous membrane produces irregularities and as a result musical sounds are heard. When this obstruction is due to a mucous plug it disappears with the loosening and expectoration of the plug, but when the same plug is more viscid in character and is more difficult to dislodge, as it is in asthma, the note is persistent.

However, in tuberculosis, particularly in the destructive lesion that is near a bronchus of fair size, this same type of rale may be heard, but in addition to the musical note, there is a sticky quality, much as the sound that may be produced when fingers, coated with a viscid liquid like honey, are separated. In this case there is, in addition to the musical quality, the factor of stickiness, and to this sign the descriptive term "sticky medium moist rale" may be applied, and while it may be heard all over the chest, careful examination enables us to localize it to one part of one lung where its intensity is maximum, and in addition over that same area there will frequently be found medium moist rales which, however, are very likely to follow almost at once on the musical rale.

Also this musical rale, if present on quiet inspiration, usually does not disappear after coughing, and at other times is only elicited with cough, followed on inspiration after coughing by medium moist rales heard only over the area of the lesion.

From the above description, this may sound like an exceedingly difficult physical sign to elicit and understand, but it is not, and in my opinion, is an exceedingly helpful diagnostic sign. While in bronchiectasis with secretion in the sacculations a similar sign may be heard, it will never be found in a "common cold" or other trivial conditions, and while no one should be expected to make any diagnosis from this sign alone, it should suggest that further study, particularly of the sputum and of roentgenograms, is indicated, and if this study is made, mistakes will be minimized.

The greater obstacle to the diagnosis of tuberculosis in the patient described above is the unusual location of the lesion. Not many years ago it was considered that in the Caucasian, tuberculosis did not occur in the base of the lung. While it was generally thought that the pathology in the apices was always tuberculous, that at the base was never of such origin.

A childhood type of tuberculosis may occur at the base of a lung in an adult regardless of race or color, but its course is usually so stormy that it is not likely to be lightly dismissed. It is not my intention to infer that tuberculosis at the base of the lung without tuberculosis at the apex is exceedingly common, but in the course of a year it is our usual experience to see several patients with active tuberculosis at the base of a lung in whom there is no demonstrable evidence of active tuberculosis at either apex, and a few, with no evidence on physical or roentgenological examination that there has ever been an adult lesion at the apex.

A much more common occurrence is to find on physical examination evidence of pathology at one base, occasionally at both, with no evidence of tuberculosis at the apex of either lung, and it is this distribution of pathology that may readily mislead us.

Because physical examination suggests the disease is at the base, it does not mean that there is not an active lesion at the apex. For some unexplainable reason, when tuberculosis develops in the base of the lung, the lesion at the top of that or the opposite lung, which is probably the source of the infection which has spread into the base, seems to become less active in its manifestations.

Recently McPhedran[1] has reported his experience with a group of patients whose apical tuberculous lesion has retrogressed with the onset of a chronic non-tuberculous lesion in the cardiophrenic area of the lung. While our experience would suggest that this latter lesion is usually tuberculous, it does parallel his in the frequency with which, following the onset of it, the primary one improves, and is very frequently silent as far as physical signs are concerned.

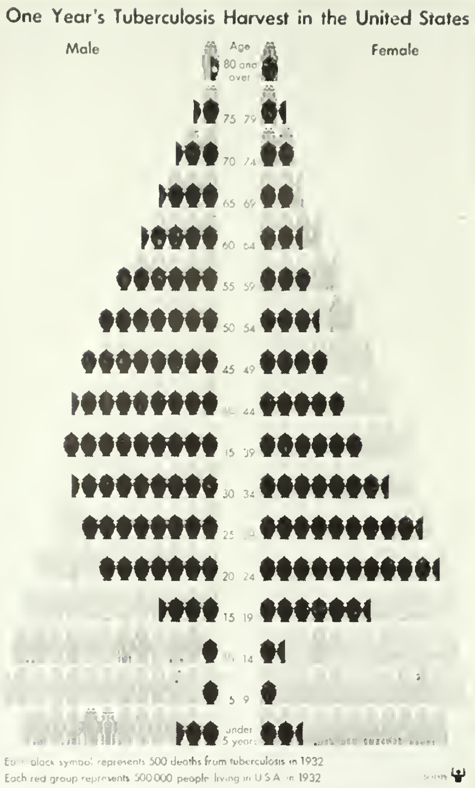
Of course in some cases there is apparent activity throughout the lung and there is then little difficulty in the diagnosis. Error can be prevented in a large percentage of the cases if, in addition to what we learn from history and find on physical examination, a good roentgenogram is made, but unfortunately many physicians do not have available such facilities.

Under such circumstances we should forget that there is no tuberculosis in the family of the patient, and ignore the fact that he believes he has only had a "cold" and nothing more serious, because he has not lost weight, strength, or appetite, nor had night sweats or elevation of temperature, and should remember that tuberculosis may occur in any part of the lungs, and may manifest itself by any symptom or combination of symptoms and physical signs that ordinarily occur in any other disease.

If it is possible to obtain good roentgenograms, the cause of his ill health may be apparent, if it is not, repeated sputum examinations if positive, will make a definite diagnosis possible, but unfortunately if negative, will not rule out tuberculosis. If it is impossible to obtain adequate roentgenograms and the sputum shows nothing, frequent examinations of the chest will finally indicate the cause of the prolonged cough, and since then competent roentgenological examination will be obtained, no matter how difficult, it would seem that the best course to follow would be to have this important examination made early in all patients who present themselves with a cough of prolonged course, for only in that way can serious disease of the chest be prevented from developing from that early and relatively easily cured stage.

REFERENCE

1. McPhedran, F. M.: The Distribution and Prognosis of Pulmonary Lesions, Am. J. Med. Sci., 190, 659, 1935.



The new "Christmas Tree" chart

IMPORTANT MEETING

The Tenth Conference of the International Union against Tuberculosis will meet in Lisbon, Portugal, September 7-10, 1936, under the chairmanship of Professor Lopo de Carvalho, President-elect of the Union. The Biological subject: "Radiological aspects of the pulmonary hilum and their interpretation" will be presented by Professor Lopo de Carvalho. Among the ten countries to take part in the formal discussion, the United States will be represented by Dr. Henry C. Sweany, Medical Director of Research of the Chicago Municipal Tuberculosis Sanitarium. The report on the Clinical subject, "Primary tuberculous infection in the adolescent and the adult," will be given by Dr. Olaf Scheel of Norway, and Dr. Robert E. Plunkett, Director of the Division of Tuberculosis, New York State Department of Health, will represent the United States in the discussion. The opening report on the Social subject, "The Open Case of Tuberculosis in relation to family and domestic associates," will be presented jointly by Dr. Charles J. Hatfield, Director of Henry Phipps Institute, Philadelphia, Pa., and Dr. D. A. Powell, representing Great Britain. The Organization Committee of the Conference has secured reductions in hotel prices and railroad fares. It has also prepared an attractive program of receptions and excursions to enable members of the conference to visit the chief anti-tuberculosis institutions of Portugal and, in addition, to see some of the most picturesque scenery of the country. Members of the Union are invited to take part in the conference without payment of a fee. Other persons may participate as "Members of the Conference," and application should be made through the National Tuberculosis Association, 50 West Fiftieth Street, New York. Plans for a special party to the Conference may also be secured by writing to the Association.

BOOK NOTICE

A BEAUTIFUL BOOK FOR THE PHYSICIAN'S LIBRARY

The Medicine Man of the American Indian and His Cultural Background, by WILLIAM THOMAS CORLETT, M.D.; first edition, 369 pages plus bibliography and index, 16 full page plates and eight reproductions of woodcuts; Springfield, Illinois: Charles C. Thomas: 1935. Price, $5.00.

This work is more than its title implies. It presents what the Indian medicine-man knew about medicine and therapeutics, yet it also elaborates on the American Indian's theology, his legends, his sociological *mores*, and even inquiries into his origin.

The author, who has been professor of dermatology and syphilology in the Western Reserve University School of Medicine, and president of the American Dermatological Association, has been painstaking in his labors, with the result that few other similar volumes can be compared to this work for scope and inclusion.

He presents the South American as well as the North American Indian, the Alaskan Eskimo as well as the Aztec and the Maya. His research took ten years of constant application; he travelled from the most northerly points of Alaska to the most southerly parts of Pntas Arenas, South America.

The book itself, physically, is a delight. It is set in Garamont, and printed on rag paper, bound to a King's taste. The illustrations are very good. It is a work which can bring nothing but credit and encomiums upon its publisher.

A POPULAR SCIENCE BOOK OF FASCINATION

Outposts of Science, by BERNHARD JAFFE; first edition, heavy cloth, silver library label, 547 pages, illustrated; New York: Simon & Schuster, Inc.: 1935. Price, $3.75.

To the trained mind and eye, a layman writing on science is perforce a suspicious character: there is ever the danger that his subject may overmaster the stature of his qualifications for the task.

When Jaffe errs, he errs on the side of enthusiasm, a quality which most men of science instinctively abhor. It may be said in extenuation of Jaffe's more Wagneresque passages, however, that each scientist concerned in this work saw proofs of the section devoted to him, and returned corrected proofs to Jaffe before the work reached the pressmen.

What concerns the physician are the sections dealing with Maud Slye, Ellice McDonald, John J. Abel, and Thomas Hunt Morgan. Lesser figures in medicine are considered, but inasmuch as the work deals with all fields of U. S. science, medicine is but one part of this directory of American research.

Mr. Waldemar Kaempffert, in *The New York Times* of December 22, 1935, bemoans the fact that Jaffe has not given this book a philosophical interpretation. Pursuing this reasoning, we ought to castigate William Osler because in his *Medicine* he neglected to explain Petrarch's allegorical terzine, *I Trionfi*.

This is a well-written, inclusive work for the U. S. layman, intelligently written and soundly-presented.

AN ILL-DONE PIECE OF WORK

Nervous and Mental Diseases: A Simplified and Comprehensive Presentation of Nervous Diseases and Insanity, by BERNARD S. MALOY, M.D., with an introduction by JOHN H. WIGMORE, A.M., LL.B., LL.D.; dark fabricoid, first edition, 551 pages and 40 illustrations; Indianapolis, Indiana: The Bobbs-Merrill Company: 1935. Price, $7.50.

Dr. Maloy is a past acting assistant surgeon of the United States Public Health Service, and in his introduction states that the book was written for the physician, student, and that it might be helpful to the lawyer. It is not in any sense a textbook, since whatever treatment he does present is extremely condensed. Moreover, the work contains errors, and shows the unfelicitous effects of having been written down to the level of the lay reader. The illustrations, coming for the most part from the Northwestern University Medical School, are clear. It must be confessed, however, that in the main the book is disappointing. It is not to be recommended.

A NEW UROLOGY TEXT

Principles and Practice of Urology, by FRANK HINMAN, A.B., M.D., first edition, dark blue cloth, gold-stamped, 1,111 pages with 513 illustrations and 48 tables; Philadelphia and London: The W. B. Saunders Company: 1935. Price, $10.00.

The competent urologist is incumbent to master both the biological and the clinical aspects of his field. He must be a trained cystoscopist, an unerring diagnostician, and a skilled surgeon. Lacking any one of these achievements, the urologist falls short of the stature demanded by the classical tenets of urology.

Dr. Hinman, clinical professor of urology in the University of California Medical School, is a disciple of Hugh Hampton Young of Johns Hopkins, under whom he studied. Hinman brought himself to the writing of this text with a resolution, an understanding, and a scope of experience which insured the integrity of the work from its inception.

For it may be said that this text presents in one volume nearly everything the practitioner may ever learn from the written word. Venerology is thoroughly considered, with a worthy discussion on the diagnosis and treatment of gonorrhea. Instrumental examination is clearly set forth; and there is presented every urologic condition which the urologist is ever likely to encounter.

For both general practitioner and urologist, this work is of paramount value. It is probably the best one-volume urology text now extant.

WORLD ATLAS OF DISEASE

A Geography of Disease, by EARL BALDWIN McKINLEY, M.D., assisted by FREDERICK P. GAY, M.D., RICHARD P. STRONG, M.D., and the late THEOBALD SMITH, M.D.; first edition, 453 pages plus appendix and index, heavy red cloth, gold-stamped, no illustrations; Washington, D. C.: The George Washington University Press: 1935. Price, $5.00.

Strictly speaking, this is not entirely a new work in the sense that it is the first reporting of an extended series of studies. Yet there has never before been a geography of disease. This is the first work on the rather staggering subject.

The book was made possible by the American Leprosy Foundation (formerly the Leonard Wood Memorial) working in conjunction with the Division of Medical Sciences of the National Research Council. Earl Baldwin McKinley, M.D., dean and professor of bacteriology in the George Washington University School of Medicine, served as director of studies, assisted by Frederick P. Gay, M.D., of Columbia University, Richard P. Strong, M.D., of Harvard, and the late Theobald Smith, M.D., of the Rockefeller Institute at Princeton, New Jersey.

An almost limitless amount of material has been collected and presented herein. Every section of the world is represented, its endemic disease classified, and sundry factual information included regarding each section's physical and climatic factors. For the epidemiologist, the medical statistician, and especially, the military or tropical physician, this work should prove to be a very valuable lexicon and atlas.

A REVIEW OF PARATHYROID LITERATURE

The Parathyroids in Health & Disease, by DAVID H. SHELLING, B.Sc., M.D.; first edition, dark green cloth, gold-stamped, 305 pages plus appendix and index, illustrated; St. Louis: The C. V. Mosby Company: 1935. Price, $5.00.

David H. Shelling, B.Sc., M.D., instructor in pediatrics in the Johns Hopkins University School of Medicine, and frequent contributor to the literature on liver and carbohydrate metabolism, the physical chemistry of calcification, etc., has written this book with both the clinician and the investigator in mind. Much of the material herein presented is the result of the author's experiences in the Johns Hopkins Hospital and laboratories, where he has worked for several years. Some material, as might be expected, has been drawn from contemporary writings of such men as Collip, MacCallum, Hernheimer, *et al.*

Anatomy, pathology, physiology, of the parathyroids all are adequately treated. The chapter on the parathyroid hormone is valuable; but perhaps more pertinent to the average physician is the chapter *Use and Abuse of Parathyroid Hormone and of Parathyroidectomy.* There is a comprehensive appendix, and an inclusive bibliography. The work can be recommended.

ANIMAL DESTRUCTION

Our Enemy, the Termite, by THOMAS ELLIOTT SNYDER, A.B., M.F., Ph.D.; first edition, 196 pages, dark brown cloth, gold-stamped, illustrated. Ithaca, New York: The Comstock Publishing Company, Inc. Price, $3.00.

Returning to Washington from the hymeneal delights of a Southern honeymoon in 1922, Thomas Elliott Snyder paused long enough in Charleston, South Carolina, to observe termite pellets in a telegraph pole. With but thirty minutes to train time, he dashed out, procured a hatchet, and proceeded to hew out a huge wedge of the termite-infested wood to take back with him, even though the pole was situated on one of the main thoroughfares of Charleston.

This incident but typifies the industry and dispatch with which Snyder has pursued the study of termites for the last twenty-six years. As senior entomologist of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, he probably knows more about the termite than any other man alive. His work shows it. The book is complete, logical, orderly, and authoritative. Being the first competent work on a subject so thoroughly misunderstood by the mass of men, it is salutary to turn its pages. The Journal-Lancet recommends it.

CHRISTOPHER'S SURGERY

A Textbook of Surgery, by various American authors, edited by FREDERICK CHRISTOPHER, B.S., M.D.; first edition, heavy red cloth, gold-stamped, 1,608 pages with 1,349 illustrations on 730 figures; Philadelphia: The W. B. Saunders Company: 1936. Price, $10.00.

Doctor Christopher's plan for the scheme of this work is essentially sound. He admits that so many advances in different branches of surgery have been made in recent years that no one surgeon could be adept in all of them. Consequently, Christopher has drawn freely upon the advice and collaboration of some of the greatest names in American surgery. Credit is readily extended to these men.

Two members of The Journal-Lancet's editorial board had a prominent part in the making of this book. They are Dr. Walter Fansler and Dr. James Martin Hayes, of Minneapolis. Dr. Roscoe C. Webb, Dr. Jennings C. Litzenberg, Dr. Owen H. Wangensteen, and Dr. Ralph T. Knight are Minneapolis men who aided in preparing the text. Rochester supplied these physicians: The late Edward Starr Judd, Alfred W. Adson, Donald Church Balfour, Winchell Craig, Ralph K. Ghormley, Samuel F. Haines, Stuart W. Harrington, Melvin Starkey Henderson, Henry William Meyerding, Hamilton Montgomery, John Pemberton, Porter Vinson, Waltman Walters, and Russell M. Wilder.

With such an array of authorities (and this list represents only those in or close to the Twin Cities), a text could not be otherwise than impressive. Dr. Christopher, who is associate professor of surgery in the Northwestern University School of Medicine, Chicago, Illinois, has been very circumspect about his labors. As a result, the volume stands as a work of the first magnitude. It should achieve widespread acceptance in short order.

THERAPEUTICS EDITED BY FANTUS

The 1935 Year Book of General Therapeutics, edited by BERNARD FANTUS, M.S., M.D., first edition, dark blue cloth, gold-stamped, 440 pages plus indexes, illustrated; Chicago, Illinois: The Year Book Publishers, Inc.: 1936. Price, $2.25, postpaid.

This is the well-known year book compedium edited by Bernard Fantus, M.S., M.D., professor of materia medica, pharmacology, and therapeutics, University of Illinois College of Medicine at Chicago, director of therapeutics at the Cook County Hospital in Chicago, and member of the revision committee of the United States Pharmacopoeia and the National Formulary.

As such, it presents the most noteworthy events in the field of general therapeutics which were published during the year 1935, and the selection of material within these pages is very broad in scope. Part of the material has been taken from the eleventh revision of the United States Pharmacopoeia, in which Professor Fantus had a hand, and which he calls "the great event of the year" insofar as therapeutics is concerned.

Professor Fantus has republished a paper by one member of the board of editors of The Journal-Lancet, Dr. Walter A. Fansler's "The Use of Electro-Coagulation in the Treatment of Rectal Carcinoma," which originally appeared in the August 1, 1935, issue of The Journal-Lancet.

The
JOURNAL
LANCET

Represents the Medical Profession of
MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

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South Dakota State Medical Association
Montana State Medical Association
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MINNEAPOLIS, MINN., APRIL, 1936

THE SILENT DISEASE

The hacking cough, the hectic cheek, the glistening eye like that of a hunted animal at bay, are like so many loud speakers. Hearing and seeing them, the most indifferent passerby shudders and whispers "consumption." In its earlier stages tuberculosis proclaims itself less obviously to the layman but to the trained ear, râles, symptoms and history bespeak an unmistakable diagnosis. However, what really counts in modern medicine is to discover tuberculosis when it is "yet as a little cloud the size of a man's hand." In its minimal stage, when the prognosis is still hopeful, tuberculosis is, in the majority of cases, a silent disease. Unless it is suspected and definitely searched for, it is likely to be overlooked.

Those who see the steady stream of patients entering the tuberculosis sanatorium deplore the all-too-evident delay in making the diagnosis. About five out of each six patients in our sanatoria throughout the country are classified on admission as moderately advanced and far advanced cases of tuberculosis. And this ratio has not improved to an appreciable extent for the past ten years, during which time an enormous amount of education of the people concerning the early danger signs of tuberculosis has been carried on. One reason for delay in diagnosis is undoubtedly to be found in the lethargy of the people, coupled with the common human failing of not wishing to face unpleasant facts. Another reason perhaps is that the transition from early, "silent" tuberculosis to the moderately advanced stage, is usually a relatively swift one and only by the barest chance is the minimal case detected. Many conscientious doctors constantly on the alert for tuberculosis are despairing of increasing their batting average of discovering the disease in its incipiency. So long as we are obliged to wait until symptoms betraying pulmonary damage drive the patient to our offices, we shall probably continue to despair.

Wrestling with this deplorable state of affairs, efforts have been made to devise some new way of detecting tuberculosis in its silent stage among apparently healthy people. Chadwick, Rathbun, Myers, and others pioneered in introducing the scheme of examining routinely with tuberculin and the x-ray, students in colleges and high schools. This procedure, modified in various ways has "caught on" throughout the country. The routine examination of all students brings to light early cases that might otherwise be undetected and progress to disabling disease. Lees, who examined last year all students of the University of Pennsylvania by the tuberculin-X-ray method, found 17 cases of adult type pulmonary tuberculosis, of whom all were symptomless and only one was dismissed from school. Contrast this with the usual method of "passive" case finding, i. e., waiting for persons to apply to the doctor for the relief of symptoms. Lees reports that during the course of the same year, 15 cases of tuberculosis had been discovered among students who came to the doctor because of one or another symptom. Twelve of the 15 were advanced cases and were obliged to leave school.

In high schools the story is substantially the same except that fewer cases of adult type tuberculosis are found. However, follow-up work of adolescent children with significant childhood type lesions leads the investigators into many homes where there is an open case. This is important, for the real threat to the youngster is probably not the calcified remains of a primary complex but daily contact with a source of infection. No wonder proponents of the routine tuberculin-X-ray plan emphasize the value of locating such sources of infection. In grade schools the routine method has not been found so productive but where funds and facilities are available, it is certainly an excellent addition to our school health program.

H. E. Kleinschmidt, M.D.,
National Tuberculosis Association.
New York City.

FLICK OUT CANDLES WITH A CLEAN NAPKIN

To "chew Peerless, spit in the snow and be tough" was not a remarkable rarity in our boyhood days. It was then a common practice among the lumberjacks of the north to show their shooting skill by long distance projection of salivary fluid, and brown stains on the snow-covered sidewalks served to prove their ambitious achievements beyond a doubt. Southerners lacking snow added accuracy to the sport as they sat on dry-goods boxes in front of the small town store aiming their mandibular explosives at knot holes in the sidewalk. The game was contagious and played in private and public places alike, even invading the sacred halls of justice; trial lawyers never pleaded a handicap, in fact they prided themselves on their ability to shoot a hole in one with feet on the table. Short spitters and long spitters eventually ended their career as mere dribblers.

Now let us see what happened to this colorful multitude. Some ambitious health officer, entirely devoid of sporting instinct but coveting a posthumous monument in the hall of fame girded his loins for battle against this vicious practice of besmirching the landscape and befouling the air with pathogenic enemies to the human race, so laws were enacted and warnings posted. It was an international dilemma and a universal crusade was launched. In the *strassenwagens* of Berlin and Vienna went up the placard: *Es ist strengstens verboten auf boden des wagen zu spuchen*

We have resorted to epithets of vulgarity with but one object in mind and that is the discouragement of a nasty vestige of the habit that still remains: the blowing out of candles on a birthday cake. How long, oh Lord, must physicians endure this insanitary spectacle? It is a thoughtless, repulsive and damnable custom. A. E. H.

IVAN PETROVITCH PAVLOV, 1849-1936

The death of Pavlov, in his 87th year, brings to a close a long career of great importance in the field of physiological research. He was easily the most outstanding figure in the science of medicine in Russia over a long period of years and the quality of his achievements was internationally recognized to the fullest degree. He was a Nobel prize winner in 1904.

His first important work and that for which he is probably the best known was in connection with the physiology of digestion. This, Fulton tells us, he began at the age of forty. The most spectacular part of it was in his successful isolation of a small auxiliary stomach, with nerve supply intact, in which he could observe the secretory mechanism without food contact. In this connection, as in all his other work, he made extensive use of trained assistants and co-workers, who pursued independent studies under his guidance. It was this ability of his to utilize and co-ordinate the competent work of others that enabled him to cover an immense amount of ground in his researches, far more than he alone as an individual worker could have done. In all his writings he gave full credit to all these colleagues and also encouraged them to publish their findings independently.

Even more noteworthy than his work on the function of the alimentary tract was that on conditioned reflexes, a study of the normal, inherited reflexes as modified by various inhibitions. He spent the last thirty years of his life in this important task, opening up an entirely new approach to the study of the functions of the central nervous system and laying a substantial basis for an enormous field of development.

Although his earlier years were beset with hardship and poverty, it is gratifying to know that the Russian government was quick to back his efforts with financial support as soon as the value of his work became manifest, indeed, in the later years he was offered more by the Soviet government than he was willing to accept, for he felt that he should receive no more than other scientists. G. C.

MEDICINE MARCHES ON

For approximately a decade, evidence has been accumulated which shows that tuberculosis as it is dealt with in our hospitals is hazardous to the students of nursing and medicine. This has occurred because patients known to have tuberculosis and those in whom unsuspected tuberculosis co-existed with the condition for which the patient entered the hospital were treated in the usual hospital routine. During the past few years changes which would protect our students against these hazards have been widely discussed. The members of the Administrative Board of the Medical School of the University of Minnesota recently voted unanimously for a procedure which will reduce these hazards to a minimum.

The procedure which was instituted at the hospital on the campus of the University of Minnesota employs standard methods. *First*, the unsuspected case of tuberculosis is detected by the administration of the tuberculin test to all patients entering the hospital, regardless of the admitting diagnosis. The test screens out those who have foci of tubercle bacilli in their bodies. *Second*, X-ray film examinations are made of the chests of all patients reacting positively to the tuberculin test. This serves as an excellent screen to detect those who have disease in the lungs sufficiently large to cast shadows. The fact is well established that tuberculosis in a communicable form usually is sufficiently developed to cast a shadow on the X-ray film. However, not all shadows seen on X-ray films are due to tuberculosis or are all which are caused by tuberculosis indicative of communicable disease. Therefore, the *third* step consists of very careful clinical and laboratory examinations of all persons whose X-ray films reveal shadows, to determine whether they are due to tuberculosis, and if so, whether it is in a communicable form.

The finding of communicable tuberculosis coexisting with the condition for which the *patient* was admitted to the hospital does not bar the *patient;* such *patients* are to be treated under strict isolation technic in a unit set aside for communicable disease. Thus, the students of nursing and medicine, as well as faculty members and others employed in the hospital, may go about their work with safety so far as contracting tuberculosis is concerned, which make the working conditions there comparable to that in the schools of education, law, etc.

A similar procedure is being contemplated in many places. For example, in a Bulletin recently issued by the Staff of the Lowman Memorial Pavilion of the Cleveland City Hospital, the following statements are made: The Lowman Memorial Pavilion Staff recognized pulmonary tuberculosis as a communicable disease which offers a certain hazard to those members of its personnel in constant and close association with large numbers of infectious individuals. The Department has, therefore, adopted a technique of medical asepsis which it believes will afford adequate protection against the transmission of the disease.

Since patients are frequently admitted to the Pavilion before the establishment of a definite diagnosis of pulmonary tuberculosis, it has been thought necessary to offer some measure of protection to those who are non-tuberculous. The technique thus provides for the observation (isolation) of all patients on admission, until the diagnosis of tuberculosis is definitely established.

The time is not far distant when nearly all hospitals will make careful examinations for tuberculosis in communicable form of all patients admitted and all who are found to have communicable disease will be treated in rooms or wards where the isolation technic will be carried out in a manner no less strict than that now employed for diphtheria. Anything short of this does not adequately prevent the spread of tubercle bacilli in our hospitals.

J. A. M.

TUBERCULOSIS AND IMMIGRATION

The frequency with which tuberculosis is discovered in alien students enrolling at the University of Minnesota would lead one to suspect that the problem of tuberculosis eradication in our own population is constantly being added to through immigration.

Since 1928 at the University of Minnesota a tuberculin test has been done routinely on all entering students. All of those reacting positively are followed up with X-ray film examination of the chest. By this procedure pulmonary tuberculosis is discovered in individuals whose general appearance in no way suggests it and physical examination methods do not detect it.

The general use and application of any new scientific procedure usually lags many years behind its discovery and perfection. This statement is exemplified by the degree or extent to which medical science is applying modern methods for the control of tuberculosis. The discovery of pulmonary tuberculosis in any individual is now comparatively simple and relatively certain through the application of two feasible procedures, namely, the tuberculin reaction and X-ray film examination.

The first tuberculin test was made on a human in 1890 by Robert Koch, but its important diagnostic significance in the field of public health was not generally recognized until quite recently.

The first tuberculin tests on cattle were made in Dorpat, Russia, in 1891 and by Cotton and Pearson in this country in the same years. Veterinary science immediately recognized its diagnostic possibilities. Without delay they put it into practice to discover tuberculous cattle. These tuberculous animals were removed from the herds to prevent infection of the non-tuberculous animals. The effectiveness of this procedure is evidenced by the fact that 33 states and the District of Columbia now have reduced the incidence of tuberculosis in cattle to practically zero and that the remaining states have completed more than 50 per cent in their eradication programs.

All states have enacted laws to prevent the importation (immigration) across their borders, of cattle which have not been tested and declared tuberculosis-free. The Federal government holds in quarantine all cattle imported into this country and during this period of quarantine a tuberculin test is administered. In case the reaction is positive, the animal is refused admission.

The eradication of tuberculosis in our human population involves the same principles which have been used so successfully by the veterinarian, namely: (1) The discovery of persons who have tuberculosis in communicable form; (2) the removal of these from contact with the non-infected members of the population, or treatment so as to render the disease non-communicable; and (3) the prohibition of introduction of tuberculous individuals into our population from without.

Although the program relating to the first two principles is far from complete, evidence is accumulating that progress is at last being made. Concerning the third principle, that relating to immigration, the solution should be relatively simple.

Perhaps in the not far distant future, the examination of aliens entering this country will include a tuberculin reaction plus a chest X-ray film examination when this is positive. Those with demonstrable pulmonary lesions will be refused admission. When that is done we shall probably be giving our human population a protection comparable to that which veterinarians have been giving our animal population for many years. RALPH V. ELLIS, M.D.

SOCIETIES

TENTATIVE PROGRAM
of the
EIGHTY-THIRD ANNUAL MEETING
of the
MINNESOTA STATE MEDICAL ASSOCIATION
Rochester, May 3-6, 1936

PROGRAM

Business Session—The Kahler Hotel

Sunday, May 3

Council.
Reference Committee.

Sunday Evening

House of Delegates.

Monday, May 4

Council.

Tuesday, May 5

House of Delegates (Luncheon)
Council.

Wednesday, May 6

General Assembly

Presentation of Officers.

Announcements

Scientific Exhibit Award—A medal has been donated by the Southern Minnesota Medical Association for the best scientific exhibit. The Scientific Demonstrations and Exhibits shown in the exhibit hall are eligible.

The Scientific and Technical Exhibits—These exhibits are of unusual interest and every member should arrange to spend some time visiting them. The exhibitors have gone to a great deal of effort in order to present to you medical subjects of special interest.

You are advised to read the list of Scientific Demonstrations and Exhibits over carefully, check them and make it a point to visit those you are interested in early.

The Women's Auxiliary is printing its own programs and the members should see that they obtain one so that they will not miss the delightful social events that have been provided by the Women's Auxiliary of the Olmsted-Houston-Fillmore-Dodge County Medical Society.

SCIENTIFIC SESSIONS
Monday, May 4

Morning Session

Clinics by the Mayo Staff.
Scientific Demonstrations and Exhibits.
The Cancer Problem—Speaker to be announced.
Citizens Aid Society Memorial Address.
Luncheon.

Monday, May 4

Afternoon Session

"Functions of the Spleen," Leon Asher, M.D., Berne, Switzerland, Professor of Physiology, University of Berne; Director of the Physiological Institute of Berne.

"Foreign Bodies and the Use of X-ray Examination in Their Localization and Removal," Willis F. Manges, M.D., Philadelphia. Russell D. Carman Memorial Lecture, Minnesota Radiological Society, sponsor.

"The Treatment of Gall Tract Disease As Determined by Its State of Development and the Patient's General Condition," E. L. Tuohy, M.D., Duluth.

Scientific Demonstrations and Exhibits.

"Hay Fever Symposium on the Causes, Diagnosis and Treatment," C. O. Rosendahl, Ph.D.; R. V. Ellis, M.D.; H. B. Sweetser, Jr., M.D., Minneapolis.

"Oxygen Therapy," O. E. Locken, M.D., Crookston.

"A Few Axioms in Dermatological Diagnosis," H. E. Michelson, M.D., Minneapolis.

"Management of the Minor Ailments of Pregnancy," M. O. Wallace, M.D., Duluth.

"Congenital Heart Defects—Importance of Early Diagnosis," H. J. Lloyd, M.D., Mankato.

Monday, May 4

Evening Session

Medical Economics Meeting—Olin West, M.D., Chicago, Secretary and General Manager of the American Medical Association; J. Tate Mason, M.D., Seattle, President-Elect of the American Medical Association; W. W. Will, M.D., Bertha, President of the Minnesota State Medical Association; C. W. Mayo, M.D., Rochester, President of the Olmsted-Houston-Fillmore-Dodge County Medical Society.

Tuesday, May 5

Morning Session

Clinics by the Mayo Staff.

Scientific Demonstrations and Exhibits.

"The Treatment of Diabetes," Elliott P. Joslin, M.D., Boston, Professor of Medicine, Harvard University Medical School.

Luncheon.

Tuesday, May 5

Afternoon Session

"Studies in Water Balance, Dehydration and the Administration of Parenteral Fluids," F. A. Coller, M.D., Ann Arbor, University of Michigan.

"The Management of Appendicitis," E. A. Regnier, M.D., Minneapolis.

"The Role of Duodeno-jujenostomy for Duodenal Ileus and Duodenal Obstruction," G. A. Earl, M.D., St. Paul.

Scientific Demonstrations and Exhibits.

"Ileitis," O. J. Hagen, M.D., Moorhead.

"Barbiturates and Complementary Drugs for the Production of Obstetrical Amnesia and Analgesia," J. J. Swendson, M.D., St. Paul.

"Blood Transfusion," E. N. Peterson, M.D., Eveleth.

" 'Bumper' Fractures of the Tibia," O. J. Campbell, M.D., Minneapolis.

"Erythema Multiforma, Complicated by Severe Gastro-Intestinal Disturbances and Hemorrhage from Mucous Membranes in a Primipara," W. G. Workman, M.D., Tracy.

"The Surgical Treatment of Hydronephrosis, a New Operation for the Relief of Uretero-Pelvic Junction Stricture," F. E. B. Foley, M.D., St. Paul.

"Changes in Aortic Shadows Following Injuries To the Spine," M. H. Tibbetts, M.D., Duluth.

Tuesday, May 5

Evening Session

The Armory

J. Edgar Hoover, Director of the Federal Bureau of Investigation, United States Department of Justice, has on exhibit the Bureau's entire exhibit of crime detection methods. Besides ample opportunity to inspect the exhibit, there will be a talk on crime detection methods by one of the "G" men.

This will also be a social evening for members and their guests.

Wednesday, May 6

Morning Session

Clinics by the Mayo Staff.

Scientific Demonstrations and Exhibits.

"The Surgical Aspects of Peptic Ulcer"—Donald Guthrie, M.D., Sayre, Pa., The Guthrie Clinic, The Robert Packer Hospital, Sayre, Pa.

Luncheon.

Wednesday, May 6

Afternoon Session

"Diagnostic and Therapeutic Problems in Heart Disease in Children," M. J. Shapiro, M.D., Minneapolis.

Subject to be announced—G. R. Kamman, M.D., St. Paul.

"The Roentgen Findings in Biliary Fistula," L. G. Rigler, M.D., Minneapolis.

"Myxedema, Its Nervous and Mental Manifestations," G. N. Ruhberg, M.D., St. Paul.

Scientific Demonstrations and Exhibits.

"Ovarian Hemorrhage Simulating Acute Appendicitis," C. H. Mead, M.D., Duluth.

"Oleothorax in Pulmonary Tuberculosis," E. K. Geer, M.D., St. Paul.

"Upper Abdominal pain, Its Occurrence in Acute Gonorrheal Pelvis Inflammation Disease"—R. A. Johnson, M.D., Minneapolis.

Medical Question Court, W. A. O'Brien, M.D., Chairman, Minneapolis. A group of eminent specialists in the various lines will assist Dr. O'Brien.

E. A. Meyerding, M.D.,
Secretary

FIFTY-FIFTH ANNUAL SESSION

THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Sioux Falls, S. D.

May 4-5-6, 1936

Headquarters—Cataract Hotel

OFFICIAL CALL

To the Officers and Members of the South Dakota State Medical Association

The fifty-fifth annual session of the South Dakota State Medical Association will be held in Sioux Falls, South Dakota, May fourth, fifth and sixth, Nineteen hundred and thirty-six.

The Council will convene on Monday, May fourth, at two P.M. (2:00).

The House of Delegates will convene, Monday, May fourth, at seven P.M. (7:00).

The Scientific Program will be held, Tuesday and Wednesday, May 5th and 6th.

A. S. Rider, M.D., President

Attest:
J.F.D. Cook, M.D., Secretary

Monday, May 4th, 1936

2:00 P.M.—First Meeting of Council, New City Hall.

7:00 P.M.—First Meeting of the House of Delegates, New City Hall.

SCIENTIFIC PROGRAM

New City Hall

Tuesday, May 5th, 1936

9:00 to 10:00 A.M.—Clinic—"Fractures," Robert D. Schrock, M.D., 107 South 17th St., Omaha, Neb., Prof. Orthopaedic Surgery, University of Nebraska, College of Medicine, Omaha, Neb.; "Clinician," G. E. Van Demark, M.D., Sioux Falls.

10:00 to 11:00 A.M.—Clinic—"Tuberculosis," J. A. Myers, M.D., Minneapolis, Prof. Med., Prev., Med., and Public Health, University of Minnesota Medical School, Minneapolis; "Clinician, R. W. Mullen, M.D., Sioux Falls.

11:00 to 12:00 A.M.—Clinic—"Fractures," Robert D. Schrock, M.D., Omaha, Neb.; "Clinician," G. E. Van Demark, M.D., Sioux Falls.

Noon—"Alumni Luncheons"

1:30 P.M.—Address—A. S. Rider, M.D., President, Flandreau.

2:00 P.M.—Paper—"Fractures of the Elbow and Fractures at the Knee Joint," Robert D. Schrock, M.D., Omaha, Neb.

3:00 P.M.—Paper—"Modern Methods of Controlling Tuberculosis," J. A. Myers, M.D., Minneapolis.

4:00 P.M.—Paper—"Changes Confronting Modern Medicine," R. G. Leland, M.D., Director, Bureau of Medical Economics, American Medical Association, Chicago.

5:00 P.M.—Paper and X-ray Films—Robert Glenn Allison, M.D., Assistant Professor, Radiology, University of Minnesota Medical School.

Open Discussion

7:00 P.M.—Second Meeting of House of Delegates, New City Hall.

Wednesday, May 6th, 1936

8:45 A.M.—Announcements, Local Committee.

9:00 A.M.—Address—J. L. Stewart, M.D., President-Elect, Nemo, S. D.

9:30 A.M.—Paper—"The Organic Basis for Hypo and Hyperinsulism," J. C. Ohlmacher, M.D., Dean, Medical School, University of South Dakota, Director of Laboratory, Vermillion, S. D.

10:00 to 11:45 A.M.—Clinic—"Diabetes," Elliott P. Joslin, M.D., Boston, Mass., Clinical Prof. of Med., Harvard University Med. School, Boston, Mass.

11:45 A.M.—Introduction of officers; Announcements form House of Delegates, 1937 Meeting.

Noon—Allied Council Program

12:45 to 1:00—Music Concert.

1:00 to 1:15—Greetings from N. K. Hopkins, M.D., Arlington, S. D., President, Allied Council.

1:15 to 1:30—Greetings from B. A. Dyar, M.D., Pierre, S. D., General Chairman, Allied Council.

1:30 to 1:40—Music

1:40 to 2:40—Address—Elliott P. Joslin, M.D., Boston, Mass.

2:40 to 2:50—Music

2:50 to 3:30—Address—E. R. Serles, Ph.D., Member of U.S.P. Revision Committee, Dean of the Division of Pharmacy, S. D. State College, Brookings, S.D.

3:30 to 3:40—Music

3:40 to 5:00—Address—A. C. Wherry, D.D.S., President of the National Dental Association, Salt Lake City, Utah.

Banquet

6:30 P.M.—Place—**"Coliseum"**—Dr. N. K. Hopkins, Toastmaster. One minute talks from Presidents of the organizations co-operating. Short acknowledgement of speakers and short addresses by nationally prominent men. Our Guests. Social meeting and dance.

WOMAN'S AUXILIARY

of the

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

ANNUAL MEETING

Sioux Falls, S. D., May 4-5-6, 1936

President's Message—

It is a joyful privilege for me, as President of the South Dakota State Medical Auxiliary, to welcome its members and guests to the twenty-sixth Annual Convention. I extend to all a sincere and hearty welcome, and trust this meeting will form, cement and renew friendships, stimulate auxiliary interests and activities; enriching each and everyone's life thereby. We bid you welcome, and doubly welcome.

Sincerely and fraternally,
Mrs. G. E. Burman, President,
Carthage, S. D.

Officers

President—Mrs. G. E. Burman, Carthage.

President-Elect—Mrs. N. J. Nessa, Sioux Falls.

Past President—Mrs. H. B. Martin, Harrold.

Vice-President—Mrs. F. C. Nilsson, Sioux Falls.

Second Vice-President—Mrs. R. M. Baker, Sturgis.

Recording Secretary—Mrs. A. E. Johnson, Watertown.

Corresponding Secretary-Treasurer—Mrs. C. E. Sherwood, Madison.

Historian—Mrs. N. K. Hopkins, Arlington.

Publicity and Public Relations — Mrs. R. A. Buchanan, Huron.

Chairman of Exhibits—Mrs. E. S. Stenberg, Sioux Falls.

Chairman Program and Health Education—Mrs. B. M. Hart, Onida.

PROGRAM

Monday, May 4

1:00 P. M.—Registration—Cataract Hotel.

2:00 P. M.—Demonstration at the School for the Deaf, Mrs. E. S. Tillinghast in charge.

Tuesday, May 5

9:30 A. M.—Registration—Cataract Hotel.

10:00 A. M.—Business Meeting.

2:00 P. M.—Musique et Fleurs—First Methodist Church Parlors.

Wednesday, May 6

9:30 A. M.—Registration—Cataract Hotel.

10:00 A. M.—Business Meeting.

12:00 Noon—Dutch Treat Luncheon.

1:00 P. M.—Joint Meeting—Coliseum.

6:30 P. M.—Banquet and Dance—Coliseum.

Local Committees

Program Committee—Mrs. F. C. Nilsson, Mrs. N. J. Nessa, Mrs. H. R. Hummer, Mrs. E. O. Dietrich, Mrs. E. W. Elmen, Mrs. H. L. Eggers.

Social Activities in Co-operation with Dental Auxiliary Hostess Committee—Mrs. F. C. Nilsson, General Chairman, Sioux Falls; Mrs. Rezin Reagan, Invitations, Sioux Falls; Mrs. T. J. Billion, Registration, Sioux Falls; Mrs. O. C. Ericksen, Transportation, Sioux Falls; Mrs. E. E. Gage, Demonstration, School for the Deaf, Sioux Falls.

Musique et Fleurs—Hostess Chairman, Mrs. C. F. Culver; Program Chairman, Mrs. E. L. Perkins; Decorations, Mrs. S. A. Donahoe; Chairman, Refreshments and Favors, Mrs. E. S. Stenberg; Publicity, Mrs. Anton Hyden.

PROGRAM OF THE SOUTH DAKOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

NEW CITY HALL

Sioux Falls, S. D.

H. L. Saylor, M.D., Secretary, Huron, S. D.

9:00 A.M.—Post-graduate courses, by Dr. R. A. Kelley, Mitchell, S. D.

9:30 A.M.—Schilling Blood Test, by Dr. W. H. Griffith, Huron, S. D.

10:30 A.M.—Dry Clinic, by Drs. Keller, Gregg and Nilsson, Sioux Falls, S. D.

1:30 P.M.—Cataract Extraction by the Barraquer Method, by Dr. Otis R. Wolfe, Marshalltown, Iowa.

THE SOUTH DAKOTA STATE INTER-ALLIED PROFESSIONAL COUNCIL

Considerable planning, forethought and discussion by members of the State Medical Association at their 54th annual session in Pierre, May 13-14, 1935, along with representatives of other professions, prompted serious consideration of the organization of the Council of the Inter-Allied Professions. Due to rapidly changing conditions affecting all healing professions, the State Medical Economics Committee and physicians in general and with the advise of other professional organizations it was decided that in order to improve the administration of public health in the state and to enable the six professional organizations to operate more efficiently along the line of public health, the State Medical Society should take immediate steps to secure the co-operation of the State Dental Association, the State Pharmaceutical Association, State Nurses Association, State Hospital Association and the State Medical Veterinary Association in the formation of the Professional Inter-Allied Council.

For the first time in the history of South Dakota a successful attempt was made to co-ordinate the professions of the state. A meeting was called by the Executive Secretary of the State Medical Association at Huron, September 3, 1935, at which time the South Dakota Council of the Inter-Allied Professions was duly organized. Two members delegated by the president of each of the six professional associations represented their association at this meeting and formed the membership of the Inter-Allied Council.

A complete organization of the Council is as follows: The official title of the organization is "The Council of the Inter-Allied Professions of Dentistry, Medicine, Nursing, Pharmacy Veterinary Medicine and Hospital Administration." The purposes of the Council are to promote the science of art of the practice of the aforesaid professions in so far as they affect the progress, the development and the practice of the "Healing Art" in the State of South Dakota:

to lend support to the program of such other health agencies as are in any way engaged in the control or the eradication of any contagion which endangers human life: to co-operate with such state and government agencies which have for their purposes the dissemination of public health information which is designed to improve the standards of living within the commonwealth of South Dakota.

The Council consists of two representatives each from the profession of Dentistry, Medicine, Nursing, Pharmacy, Veterinary Medicine and South Dakota State Hospital Association who shall be appointed by the president or executive committee of the representative associations for a period of three years.

The officers of the organization consist of a president, a vice-president and a secretary-treasurer. These officers are elected by ballot for a term of one year and shall hold office until their successors have been elected and have accepted the office for which they have been chosen. Meetings are held annually and at such other times as the president of the Council may deem necessary. The Council maintains the power of establishing such standing and special committees as are necessary for the proper conduct of the business of the Council.

The State is divided into districts consisting of one or more counties in which District Inter-Allied Professional Councils are to be organized under the same plan as the state organization. The funds of the Council are raised by an equal per capita assessment on each of the component associations representing the professions of the Inter-Allied Council. These assessments are subject to the approval of the executive offices of each association. All disbursements of this fund are authorized by the president or by a majority vote of the Council. At the present time elaborate plans are being made for the first combined meeting of the organization. This year for the first time the six State Professional Associations are holding their annual state conventions during the week of May 4-8 at Sioux Falls. Wednesday, May 6, has been set aside for the combined meeting. An excellent and interesting program has been arranged. Speakers for the afternoon program include Dr. N. K. Hopkins, Arlington, President of the Inter-Allied Professional Association; Dean E. R. Serles, Dean of the Division of Pharmacy, State College, Brookings; Dr. Elliott P. Joslin, Boston, Mass. Professor of Medicine, Harvard University Medical School, Boston; U. S. Representative Wright Pattman of Texas and Dr. E. C. Rudolph, Minneapolis, who was a member of the Hoover Commission which investigated the cost of medical care in the United States.

A banquet will be held at 6:30 P.M., to which all members of the six professions and their wives are invited. Short after-dinner talks will be given by prominent South Dakota State officials including Senator W. J. Bulow and Senator Peter Norbeck, Governor Tom Berry, President I. D. Weeks, South Dakota State University, President C. W. Pugsley, South Dakota State College, Mayor A. W. Graff of Sioux Falls along with nationally known men who are taking part in the programs of the various professional associations during the week and many other prominent professional men of the state. Following the banquet, a ball will be staged in the Coliseum for the guests and members of the conventions.

It is expected that fully 3,000 persons will attend this group gathering in Sioux Falls on Wednesday, May 6, and it is anticipated that this will be one of the largest group meetings this section of the country has ever known.

Officers of the Inter-Allied Professional Association

President—Dr. N. K. Hopkins, Arlington

Vice-President—Dr. R. W. Ellis, Salem

Secretary-Treasurer—Dr. B. A. Dyar, Pierre

Councilors

Doctors—E. A. Pittenger, M.D., Aberdeen; N. K. Hopkins, M.D., Arlington.

Dentists—Dr. O. W. Hanson, Madison; Dr. R. W. Ellis, Salem.

Nurses—Florence Walker Englesby, R.N., Pierre; Agnes B. Thompson, R.N., Watertown.

Pharmacists—Dean E. R. Serles, Brookings; H. J. Schnaidt, Parkston.

Hospital—George Kienholz, Pierre; George Campbell, Huron.

Veterinarians—Dr. George Melody, Gettysburg; Dr. Winifred Clark, Canistota.

Committees, 1935-1936

Constitution and By-Laws—Dean E. R. Serles, Chairman; Florence Walker Englesby, R.N.; George Kienholz; Dr. George Melody.

Legislative—George Kienholz, Chairman; E. A. Pittenger, M.D.; H. J. Schnaidt; R. W. Ellis, Florence Walker Englesby, R.N.; Dr. George Melody.

Public Relations—O. W. Hanson, Chairman; George Campbell; E. A. Pittenger, M.D.; Dr. Winifred Clark; Dean E. R. Serles, Agnes B. Thompson, R.N.

Division of State into Districts—Dean E. R. Serles, Chairman; R. W. Ellis; Florence Walker Englesby, R.N.

(Signed) B. A. DYAR, M.D.
Executive Secretary
State Medical Association

TENTATIVE PROGRAM
for the
NORTH DAKOTA STATE MEDICAL ASSOCIATION
ANNUAL MEETING
To Be Held in
JAMESTOWN
May 17, 18, and 19, 1936

(More definite titles, with exact time of presentation, will be furnished in the May issue of THE JOURNAL-LANCET.)

Carcinoma of the Colon, Medical Aspects—Dr. E. G. Wakefield, Rochester.

Carcinoma of the Colon, Surgical Aspects—Dr. C. W. Mayo, Rochester.

Prognosis in Coronary Thrombosis—Dr. F. A. Willins, Rochester.

Should the New-Born Be Artificially Fed in the First Days of Life?—Dr. F. C. Rodda, Minneapolis.

Consideration of the Radiographic Study of Fractures of the Extremities—Dr. H. M. Berg, Bismarck.

Diverticulitis of the Colon—Dr. Ralph E. Weible, Fargo.

Skin Diseases—Dr. Henry E. Michelson, Minneapolis.

Obstetrics (Some Phase Of)—Dr. George E. Hudson, Minneapolis.

Transurethral Resection—Dr. F. E. B. Foley, St. Paul.

Included in the dates given above, will be the sessions of the House of Delegates and of the Councillors; also the annual meeting of the State Health Officers' Association and of the Academy of Ophthalmology and Oto-Laryngology. Details later.

Albert W. Skelsey, M.D.,
State Secretary.

Proceedings of the Minneapolis Clinical Club

Regular meeting, January 16, 1936.

Dr. Floyd Grave, president, in the chair.

Annual Senior Member Program arranged by Dr. R. C. Webb.

THE ADVANTAGES OF INCREASED VOLTAGE IN X-RAY THERAPY

Dr. R. G. Allison

The earliest attempts at X-ray therapy were reported within three months after Roentgen's discovery of the X-rays. Measuring devices, tubes and larger coils were gradually developed. As larger sources of energy became available, filters were interposed between the tube and the patient.

Clyde Snook, of Philadelphia, in 1906 developed the "interrupterless transformer." This invention placed in the hands of Roentgen therapists a machine which functioned properly, and gave a tremendous increase in the amount of radiation available.

In 1913, W. D. Coolidge, of the Research Department of the General Electric Company, invented the hot cathode tube, which bears his name. These two inventions gave not only increased voltage, but a tube capable of handling this increased energy without variation. For many years this combination of "interrupterless transformer" and small Coolidge tube gave excellent results.

During this period, radium was discovered, and almost immediately the combination of radium and X-ray therapy was instituted at several clinics. Radium at this time was used for direct application to the growth, and was also used, where sufficient amounts were available, to construct bombs for external filtered radiation.

In 1921, a machine was developed which would produce 30 milliamperes of current at 200 kilo volts. A water-cooled Coolidge tube capable of handling this amount of current was developed shortly thereafter.

With the advent of this machine and tube, the results in the combined treatment of carcinoma of the cervix and of the uterus made a marvelous advance. The amount of energy developed by this apparatus permitted still more of the softer or non-penetrating rays to be filtered out. Copper then came into use as the main filter, with a small amount of aluminum still being retained. This permitted larger doses of radiation to reach deep seated tumors without permanent damage to the intervening structures.

Notable progress was made under 200 kilo volts in deep X-ray therapy, especially when it could be combined with radium employed locally to the lesion. There still remained, however, a large group of deep seated tumors, where the local application of radium was impossible, and where it was impossible to deliver a lethal cancer dose through the skin surfaces without doing irreparable damage to the skin. The few clinics who had enormous amounts of radium were able to treat this group of cases by the external application of the highly-filtered radium. Those of us not so fortunate in the supply of radium merely retarded the rapidity of the growth, or treated the symptom-producing metastases as they occurred.

Two years ago the General Electric X-ray Corporation built three X-ray machines of pulsating-current type, capable of delivering 800 kilo volts, and also constructed an oil-cooled tube capable of handling this amount of energy.

One of these machines was placed at the University of California, one at the Memorial Hospital in New York City, and one with Dr. Henry Schmitz, at the Mercy Hospital in Chicago. Recently other manufacturers have produced similar machines.

Since its installation, it has been my privilege to follow the cases treated by Dr. Schmitz with his machine. He has operated his machine at 400, 600, and 800 kilo volts. When he reached the 800 stage in certain control cases of early carcinoma of the cervix and of the uterus, he abolished the use of radium locally in the cervix. He feels that the immediate results have been fully as brilliant as in those cases in which radium has been used locally as well. He feels, however, that when voltages of below 800 kilo volts are used, radium locally should still be employed.

We believe, however, that it is more conservative to apply radium locally to the cervix, and not to subject the normal intervening structures to more external radiation than is necessary to control the local extensions of the growth. This, in the past, has been adequately done in many patients with 200 kilo volts, and at the present time is being done much more thoroughly with 400 kilo volts of current. We are at the present time using a 400 kilo volt constant potential machine. This machine gives us a wave length of .045 Angstrom units. This is approximately three to four times the wavelength of radium.

Except for the work of Dr. Henry Schmitz, of Chicago, there has been comparatively little work done at voltages higher than 500 kilo volts. Schmitz has employed 800 kilo volts for only a short period of time.

Our problem in radiation therapy is to deliver to the tumor from four to eight times the dosage necessary to produce a surface erythema without doing irreparable damage to the skin and other intervening structures. Basically, this is done by the fractional method devised by Coutard, of the Curie Institute of Paris. Two or more portals of entry are used, and treatment is administered each day. From eighteen to thirty days is necessary for the administration of a lethal cancer dose. The average period of treatment is twenty days. If, at the end of six weeks after the last treatment has been administered, we are led to believe the tumor has not been thoroughly eradicated, a second series of treatments is administered.

Many tumors which we have found markedly resistant to radiation at 200 kilo volts are responding rapidly to radiation at 400 kilo volts. This has been true notably in carcinoma of the esophagus and carcinoma of the stomach. Bronchogenic carcinoma of the lung has also disappeared more rapidly under higher voltage therapy. Papillary cystadenoma of the ovary has shown a much more favorable response than we have been able to obtain in the past with 200 kilo volt radiation.

To briefly summarize the advantages of radiation at voltages higher than 200 kilo volts:

First. Roentgen-sickness has been almost entirely eliminated.

Second. Larger total doses with less skin reaction.

Third. Shorter time of radiation with a saving of the patient's physical strength.

Fourth. A disappearance of certain types of tumors which were not affected by radiation at 200 kilo volts.

Fifth. The presence of definite reaction in the deeper structures, such as mucositis of the bowel. This is not explainable on a total dosage basis, but shows that a different quality of radiation is reaching these structures.

PRESENT-DAY INDICATIONS FOR TONSILLECTOMY

Dr. W. E. Camp

Mr. Chairman, Members of the Clinical Club:

This subject which I bring up for discussion tonight is not one of my own choosing. I flatter myself that I have more gumption than to deliberately choose a subject in which it is so easy for one to "get his neck out." I have always thought that Dr. Webb was a friend of mine, but after he asked me to speak on this subject, I am somewhat doubtful.

Before considering the present-day indications for tonsillectomy, I would like to give a brief historical account of the operation. As early as the year 10 A. D., Celsus described tonsillectomy as an ordinary, or frequent, operation. From about this time to 490 A. D., they began to have some trouble with hemorrhage and found that this could be prevented to some extent if they did only a tonsillotomy. So for the next three hundred years, or up to about the time of Aegineta, 750 A. D., tonsillotomy was the usual surgical procedure. For the next four hundred years, complete tonsillectomy was advocated and practiced. From about 1100 to 1740, tonsillectomy was seldom done. In the early years of this period, the operation was almost obsolete, and in the later years, cautery, excision of pieces of tonsils, or even tracheatomy was advocated when the tonsils were enlarged.

From about 1740 to 1880, tonsillectomy again became a very common operation. During this period many new instruments were devised, and the operation rapidly became perfected. In 1875, the common carotid was successfully ligated for continued post-operative tonsillar hemorrhage.

From 1880 up to the present time, the operation has become increasingly frequent, and has been further perfected by numerous advances in technique and instruments. The percentage of tonsillectomies to a given area of population probably reached its peak in the years between 1920-1925. During the last five or ten years, the frequency of the operation has relatively decreased, due in part to a study of the long-period end results of tonsillectomy, and in part to a better understanding or delineation of the indications for doing tonsillectomy.

It has often been said that anything could be proven by medical statistics—well, this is certainly true in regard to the end-results of tonsillectomy. By searching through the literature for the past fifteen years, one could produce enough evidence to prove that all tonsils should be removed, or that practically no tonsil should be removed if it is possible to avoid it. When such a wide variation in the end-results or effects of the operation exist, one must lean heavily on the results of his own personal experience in determining the indications for or against tonsil removal in a given case or group of cases.

In the majority of cases, tonsillectomy, like many other surgical procedures, is an operation of election. By this I mean that in only relatively few instances is it an imperative operation. If it is true that the removal of tonsils *is* an elective operation, one must, in co-operation with the internist and pediatrician, weigh carefully in each individual case the possible benefits as against the possible detriments.

There is no evidence, either physiological, experimental, or clinical, to prove that the tonsils have any function other than that of any other lymphoid structure, *i. e.*, protection against infection. Forming the largest part of Waldyer's tonsillar ring, they undoubtedly serve as a protective barrier to deeper infections of the respiratory tract. However, when the balance of evidence shows that the tonsils are possibly doing more harm than good, they should be removed.

If one were to list from the literature all the indications for tonsillectomy, it would sound like the glossary or index of a text-book of medicine. If, however, the results in the literature are rationally-interpreted, and to this is added one's personal experience over a period of years, a logical estimate of the results to be expected from tonsillectomy may be formulated.

Probably the most comprehensive study of the end results of tonsillectomy in children after a ten-year period are summarized by A. D. Kaiser in the *Journal of the American Medical Association* for September, 1930. Kaiser's conclusions are as follows:

1. The real value of tonsillectomy cannot be definitely established in a few years. Apparent beneficial results in the first few post-operative years are not so evident over a ten-year period.

2. The incidence of sore-throat is greatly reduced over a ten-year period.

3. The incidence of diphtheria and scarlet fever is somewhat reduced.

4. Acute head colds and otitis media, though definitely reduced over a three-year period, are not essentially influenced over a ten-year period.

5. Cervical adenitis is decidedly reduced in tonsillectomized children over a ten-year period.

6. Respiratory infections, such as laryngitis, bronchitis, and pneumonia, not only are not benefited, but actually occur more frequently in tonsillectomized children.

7. First attacks of rheumatic manifestations occur from 30 to 50 per cent less often in tonsillectomized children. The greatest reduction occurring in children operated early. Recurrent attacks are apparently not reduced.

8. Incomplete operations do not offer the same benefits as those listed above.

I believe most otolaryngologists will admit that in the absence of *definite* indications or in absence of *suggestive* indications, a definite contraindication exists to the removal of tonsils.

A. Definite indications for tonsillectomy—I believe—are:

1. Frequent acute tonsillitis or peritonsillar abscess. Eliminating the possible dangers of complications in these cases, tonsillectomy is indicated for the prevention of further discomfort and disability.

2. Cervical adenitis, either persistent or recurrent acute attacks. Chronic enlargement and tenderness of the tonsillar gland at the angle of the jaw. A majority of tuberculous cervical adenitis show miliary tubercles in tonsils and adenoids.

3. Diphtheria carriers.—There is no argument that tonsillectomy renders many of these carriers bacilli-free.

4. Recurrent attacks of acute otitis media and mastoiditis. It has been proven beyond doubt that tonsillectomy and adenoidectomy in children reduces the incidence of otitis media.

5. Vincent's infection of the tonsils.—Vincent's ulcerations of the tonsils quite frequently follow Vincent's gingivitis. Being facultative anaerobes, the organisms grow well in the tonsillar crypts. Tonsillectomy can safely be performed during the period of ulceration if so desired.

6. Marked hypertrophy of tonsils and adenoids. Tonsils and adenoids removal is justifiable purely on the basis of mechanical obstruction to breathing and speech. Prevention and cure of malocclusion and adenoid facies.

7. Tonsils, which on repeated culture examinations show hemolytic streptococci or other pathologic bacteria should be removed if there is clinical evidence of a focal infection.

8. I believe the majority will agree that when acute systemic disease, such as acute rheumatism, acute glomeronephritis, or acute endocarditis, follows an attack of acute tonsillitis, the tonsils should be removed at the proper time. When this sequence of events is present no consideration need be given to the absence or presence of cervical adenitis or to frequency of attacks of tonsillitis. Systemic infection from the tonsils occurs through either the lymphatics or directly through the blood stream. It has been shown that in acute follicular tonsillitis, a bacteraemia is present in about 30 per cent of cases. Occasionally, direct thrombophlebitis of the internal jugular occurs. I have now in the hospital a case with the following sequence—acute tonsillitis, acute otitis media, lateral sinus thrombosis, septicemia, and brain abscess. The mastoid was sclerotic with practically no cells, and no demonstrable mastoiditis. I believe that the bacteraemia is directly secondary to the tonsillitis and the brain abscess is probably hematogenous.

B. Probable or suggestive indications for tonsillectomy are:

1. Any systemic condition in which a focal infection is probably etiologic and in which all other foci have

been eliminated. In this group of cases should be included, arthritis (excluding arthritis deformans), neuritis, myalgias, and growing-pains in children, infection myocarditis, and endocarditis, iritis, and iridocyclitis, erythema multiforme, recurrent or chronic glomeronephritis, pyelitis, hematogenous (non-specific) prostatitis, and infections thryreoditis.

2. In certain bacterial allergies where other foci have been eliminated.

3. In some cases of gastric and duodenal ulcers.

4. In cases of lumbago and recurrent sciatica.

5. In some cases of chronic eczema.

6. In some cases of pulmonary tuberculosis, when the patient's condition warrants the removal of the focal infection. About 66 per cent of the tonsils removed in the tuberculous show miliary tubercles in the tonsils which cannot be diagnosed grossly.

7. Tonsillectomy, at the proper time, is indicated in cases of lupoid tuberculosis involving the tonsils, pillars, and palate.

In this entire group of cases coming under the heading of probable indications, the advisability of tonsillectomy rests almost entirely with the internist or pediatrician rather than the otolaryngologist. Inspection of the tonsil may help some, but negative findings are of no value. Many times pathologic examinations of the excised tonsils in these cases show cryptical ulceration and abscess not visible on inspection.

C. Unfavorable results following tonsillectomy can be grouped into the following:

1. Operating in cases where definite contraindications exist—such as—during an acute tonsillitis or peritonsillar abscess, hemophilia, marked anemia, general debility, status lymphaticus, etc.

2. Incomplete operations leaving buried pieces or remnants of lymphoid tissue.

3. Tonsillectomy in infants and very young children is usually contraindicated, except in rare instances.

4. A group of cases which over a long-time period post-operative show increased incidence to upper respiratory infection, such as laryngitis, bronchitis, and pneumonia. In Kaiser's end-results, this was the chief contraindication.

OBSERVATIONS ON THE BIRTH CONTROL MOVEMENT

Dr. R. T. LaVake

The experience of many of us leads us to the opinion that the large majority of intelligent people have believed in the philosophy of birth control for many generations, and have practiced it under the advice of that part of the medical profession that has kept abreast of scientific advance, and has been activated by a due sense of its responsibilities in regard to public health and preventive medicine. The formation of what is called the birth control movement was brought about by the realization of the presence of a most obviously unhealthful and inhuman situation, namely, that under-privileged women, who made up the large majority of those most needing birth control advice for the prevention and control of disease, were not receiving this advice, either because they were ignorant of the fact that such advice was obtainable, or because they could not afford to pay for it, and no effort was being made by organized medicine to incorporate such advice in the armamentarium of free public health clinics. Women were frequently told, at free public clinics, that they should not become pregnant again right away for the sake of their health, but when they asked how they might keep from becoming pregnant, they were told to tell their husbands to be good, or were given some other advice of equal sagacity. I feel confident that such therapeutic advice has never seemed to be a scientifically-adequate form of treatment to a majority of the members of organized medicine. However, in most places organized medicine has done nothing officially to correct the situation, because the majority has not realized that if organized medicine hopes to take a high place in the councils of society, due to the intelligence of its majority and due to its spirit of leadership, every man must get out and vote in his medical society.

Apart from the medical profession, it is quite evident that therapeutic advice of this character did not and does not seem to be an adequate form of treatment to the large majority of lay minds of every grade of intelligence and having an average sense of social responsibility.

Many physicians gave as an explanation for the inadequate type of birth control advice being given, if at all, in our public clinics, that scientific birth control instruction was not a part of the regular medical curriculum in many schools, and thus many men left medical school without a technical knowledge of the subject based on supervised instruction. In *lieu* of supervised instruction, they had learned what little they knew through the advertisements of commercial houses. The situation was deemed to be due to the apathy—if not to the open antipathy—of organized medicine toward the subject, which attitude was reflected in the schools and their graduates, who naturally would turn to organized medicine for guidance after graduation.

Most physicians had brought to their attention, in the course of their practice, the fact that the large majority of the married population were using some form of contraception. Some of these forms were known to be prejudicial to health, others were absolutely dangerous, and many were hardly more efficacious than no contraceptives at all. Questioning brought out the fact that most of their knowledge had been gained through dissimulating advertisements of commercial houses and drug store displays, as well as through quacks and unscrupulous, ignorant physicians whose advice was often more harmful than suggestions from purely commercial sources. To intelligently meet and correct, as far as possible, the whole situation, the American Birth Control League is now functioning. It is functioning as a regulatory organization that permits the underprivileged part of the public to abide by the laws and yet receive necessary advice through medical channels, and then only through medical channels especially qualified to give the most scientific and perfectly harmless advice as to methods and technic. It is hoped that this may curtail at least to some extent the present harmful tactics of some commercial houses and individuals. It is further functioning as a piece of organized machinery whereby underprivileged women may be instructed where to go for this advice, and is functioning as a philanthropic agency for the gathering of necessary funds with which to furnish materials and pay for administration.

Some of us believe that this activity should be a regular province of public health clinics and preventive medicine supported by general taxation, but until that can be brought about, some agency should handle the matter according to the laws and according to the highest ideals of organized medicine. It is not to be wondered at that the philosophy of birth control should be attacked by certain of the laity and by some members of organized medicine. When it was first proposed to use anesthetics in childbirth, there was a terrific hue and cry against it on religious grounds. Many inveigh against birth control because, as they say, it goes against nature. Whether correct or incorrect as a matter of judgment, the rights of humanity have long since taken precedence over the rights of nature. According to nature we should refuse to do a Caesarean section on a deformed mother to save the lives of mother and child. Vows of chastity go against nature, and yet we honor those, and rightly I believe, who take such vows and carry them out. One could mention such examples *ad infinitum*. If humanitarianism, with the sanction of religion, directs that we should go against the laws of nature and do all in our power to preserve the suffering and unfit after they are here, it seems to some of us that religion should sanction the still-greater humanitarian aim of trying, always in strict accordance with law, to limit the cruel multiplying of the suffering and unfit. Aside from the obvious and cogent immediate demands of public health and preventive medicine, it is a reasoned hypothesis that birth control will better the race and diminish unnecessary suffering brought about by hereditary inadequacy, moral, mental and physical, by encouraging the propagation of the race by stocks whose adequacy is evidenced by past and present achievements and independence, and by advocating propagation at a rate best suited to the health demands of mother and child, and under conditions scientifically proven to be best adapted to the proper bringing-up of all offspring, for the future benefit of the individual and society.

I have been asked to describe in particular the organization, aims and functioning of the Minnesota Birth Control League. The Minnesota Birth Control League is incorporated under the laws of Minnesota, is a component part of the American Birth Control League, and is operating under the general direction and according to the high ideals of that parent body. The Minnesota Birth Control League consists of a general membership to which all citizens of the state are eligible upon the payment of dues, and this membership is officered by a president, vice-president, secretary and treasurer. The regular business of the organization is conducted by an executive committee operating with the advice of a lay and a medical committee, made up respectively of men and women of outstanding prominence in the community, who have the confidence of all; and medical specialists. The Minnesota Birth Control League is an associated group of the Minnesota State Conference of Social Work. The practical aims of the League are: to establish contraceptive clinics manned by physicians licensed to practice in the state, who are members in good standing in recognized medical societies, and known by the medical advisory board to be thoroughly qualified to give the best advice as to contraceptive technic that medical research can offer to date; having established such clinics, to direct its educational, social service and economic machinery to the end that no woman in the state will remain ignorant of the fact that no matter how poor she may be, or how isolated she may be, means may be provided whereby, if she and her husband so desire, she may reach the clinic and find out from the physician in charge if her condition lawfully entitles her to contraceptive advice, and if so, she will receive such advice, together with necessary supplies through the aid of private or agency philanthropy; to form an educational and voting medium of great strength that may aid organized medicine, if the latter so desires, in incorporating contraception as a definite therapeutic agent in public health clinics and as a definite part of preventive medicine, and again may aid organized medicine in carrying through any legislation that it may deem wise regarding the sterilization of the insane and mental defectives.

The contraceptive clinic in Minneapolis operates under the following rules: it accepts only indigent patients who either have no physician or are referred by their physician; if the patient can afford to pay for advice and supplies and has a private physician, she is not accepted by the clinic unless the physician so desires. If the patient can pay a private physician, and she has none, she is permitted to choose from a list of physicians who have declared themselves qualified to care for such cases and have been passed upon by the medical advisory board as being of good training and members of their county medical society. Even then the League will not refer these cases to a physician unless it is in possession of a signed statement from the physician stating that he or she understands the laws of Minnesota in regard to contraception and will abide by these laws. These rules are given that you may know that the League is determined not to lend itself as another agency for the increase of pauperization, and determined not to permit people to save money on legitimate costs of private medical care that they may spend it on automobiles and other luxuries. Again, it is determined not to favor any group of physicians for any reason other than recognized qualifications to care for these cases according to the latest advances in science. The League even prohibits physicians who give their time to the clinic from buying their supplies at cost from the clinic for use in their private practice. In other words, it is attempting to be absolutely fair to physicians and commercial houses of good standing alike.

If the patient meets the requirements for acceptance by the clinic, she is examined medically and if from the findings she is considered lawfully entitled to contraceptive advice, she is carefully instructed. She then reports back to the clinic in a week to be sure that she thoroughly understands the technic and is following it accurately. If for any reason she cannot be safely fitted with a contraceptive appliance, her husband is instructed in the use of the condom. You should definitely know that no advice is given to wife or husband if either one objects. It is the intent of the League not to do violence to anyone's principles, religious or otherwise.

Many times patients are found to have pathology needing surgical or medical treatment and are referred to surgical and medical charity clinics. In some parts of the world, societies for the prevention of cancer have already taken advantage of the possibilities resident in the birth control clinics for the detection of precancerous and early cancerous lesions. The Minneapolis Clinic examines its patients every six months.

All licensed physicians and medical students are privileged to attend these clinics for instruction in technic. The American Birth Control League is furthering research for improvements in contraceptives, and our clinic is kept in constant touch with the latest advances. Carefully-kept records in every clinic permit a statistical check on results of methods.

So far, the best results have obtained from the use of the Holland type of pessary plus the use of a contraceptive jelly or cream. The method is absolutely harmless. To be efficient, these pessaries must be accurately fitted, and the patient thoroughly instructed in the technic of application and time of removal. We have encountered only one woman in a thousand in the clinic of such low intelligence that she could not learn the technic. The method is not proof against carelessness, however. Even so, our records show it to be over 90 per cent efficient. Where we know that pessaries and jellies have been used correctly, our records show a 99 per cent efficiency. At times pathology may render the use of these pessaries inefficient, at least until the pathology is corrected. It is in these cases that the husband is instructed in the use of condoms. As some women have drunken or otherwise inconsiderate husbands who will not take any precautions, every effort is being made to perfect some simple, pleasing, harmless and efficient method that can be used by every woman under all circumstances. The use of the contraceptive jelly or cream alone is approximately 75 per cent efficient. The careful combined use of the condom and contraceptive jelly would likely be as efficient as the combined use of the pessary and the jelly, but it is more frequently discontinued because of objections on the part of the male and female, and some males cannot use the condom because of inability to sustain an erection after its application.

The contraceptive régime or device called rhythm, or the safe period, we do not advise because most of us have had convincing proof of its great inefficiency from histories of patients in our private practice. In the *Zentralblatt fur Gynaekologie*, Dec. 15, 1934, No. 50, F. Weinstock analyzed 416 cases of conception which followed a single coitus during the month. 14.9 per cent conceived on the 1st-5th day of the cycle inclusive, 31.7 per cent on the 6th-10th day, 28.6 per cent on the 11th-18th day and 24.8 per cent during the remaining days.

Although to medical men all measures for public health and preventive medicine stand or fall entirely on their merit from the standpoint of improvement of health conditions, yet it is not unimportant to note that in every instance in the past, preventive medicine has resulted in a tremendous economic saving to the community. It is the opinion of many that birth control will be no exception in this regard. Consider the costs in sickness and invalidism of numerous pregnancies in the physically unfit, together with the costs of the care of sickly progeny. Compare the costs of birth control with the costs of allowing women to solve the problem of birth control by total abstention from intercourse. The latter solution, as we know, leads to marital infelicity, infidelity, desertion and divorce, with consequent conditions that have been proven to be, in over fifty per cent of cases, a perfect medium for juvenile delinquency and crime, with all their attendant expense to the community. Again, infidelity increases tremendously the spread of venereal disease, with its economic load. Consider the number of criminal abortions, self-induced or otherwise, that many women are driven to in desperation, in their effort to solve this feature of the marital problem, with the consequent toll of invalidism and motherless homes and their attendant train of social and economic consequences. The economic and humane benefits accruing from the limitation of the insane and feeble-minded are obvious. In every instance the costs of care of these largely preventable conditions would better be saved by rational preventive measures and thus made available for the better care of unavoidable medical and surgical conditions that we will always have with us.

You will no doubt be interested in knowing how physicians in all parts of our state are responding to the Minnesota Birth Control League. To date, over 65 per cent of all calls for clinicians so far sent out to men belonging to organized medicine in every county of the state have been answered by an acceptance, and 55 out of the 87 counties of the state have a representative of the Minnesota Birth Control League. In each instance the representative is a member of the State Medical Association.

Proceedings of the Minnesota Academy of Medicine

Meeting of February 12, 1936

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, February 12, 1936. The meeting was called to order by the President, Dr. Thomas S. Roberts, at 8:10.

There were 44 members present.

Minutes of the January meeting were read and approved.

Dr. W. F. Braasch read the following Memorial to the late Dr. Judd, and a motion was carried that this be made a part of the permanent records of the Academy and a copy sent to Mrs. Judd.

EDWARD STARR JUDD, 1878-1935

With the death of Edward Starr Judd from pneumonia on November 30, 1935, the world lost one of its most outstanding surgeons and humanity one of its benefactors. Dr. Judd was born in Rochester, Minnesota, July 11, 1878, son of Edward F. and Emma J. Judd. He was educated in the public schools in Rochester, and received the degree of Doctor of Medicine from the University of Minnesota Medical School in 1902. He interned in St. Mary's Hospital in Rochester, and became first assistant to Dr. C. H. Mayo. Later he was appointed head of one of the sections in the Division of Surgery in the Mayo Clinic, as well as surgeon at St. Mary's Hospital. He was made Professor of Surgery in the Mayo Foundation Graduate School of the University of Minnesota in 1920. During the war he was director of the school of instruction for officers and enlisted men of the medical corps stationed in Rochester.

He was married to Miss Helen Berkman of Rochester in 1908, and she with their five children survive him.

Dr. Judd was a member of the Minnesota State Medical Association, the American Surgical Association, the Western Surgical Association, the Society of Clinical Surgery, the American Medical Association, the American College of Surgeons, the Interurban Surgical Association, the Southern Surgical and Gynecological Association, the Southern Minnesota Medical Association, the Minnesota Academy of Medicine, the Minnesota Pathological Society, the Association of Resident and Ex-Resident Physicians of the Mayo Clinic, Sigma Xi, Alpha Kappa Kappa, and was a member of several societies in foreign countries. He was given the degree of Doctor of Science by the University of Maryland in 1934.

Seldom has the loss of a physician caused such sincere and widespread sorrow among medical profession and laity alike. There was a depth and sincerity in his personality which endeared itself to all who came in contact with him. He was unassuming in his manner and modest almost to self-effacement. If ever there lived a man who loved the truth and despised falsehood and pretension, it was Starr Judd. He was a man's man and was most happy when among them. He was fairly worshiped in the circle of his intimate friends. A striking example of the unique popularity which he enjoyed among his colleagues was shown by his election to the presidency of the American Medical Association by virtual acclamation and against his wishes.

Apt pupil of the great masters of surgery, Doctors Will and Charles Mayo, he took full advantage of his opportunities. Because of his technical skill and sound surgical judgment he was generally regarded as one of the world's leading surgeons. He took keen interest in many of the young surgeons who had their training under him, many of whom have since become prominent surgeons. In keeping with his wide scientific interests, he spent much of his leisure time in recent years in following and encouraging the work carried on in experimental laboratories. His scientific contributions to periodical medical literature and to many textbooks number more than three hundred and have left a lasting impression on contemporary American surgery. These and the memory of his many fine qualities of mind and character will keep his influence alive for years to come.

The Committee:

D. C. Balfour,
Waltman Walters,
William F. Braasch.

* * *

The scientific programs followed.

THE RELATION OF RETINAL CHANGES TO THE SEVERITY OF THE ACUTE TOXIC HYPERTENSIVE SYNDROME OF PREGNANCY

Robert D. Mussey, M.D.
Rochester

Dr. Mussey gave his Inaugural Thesis on the above subject.

Abstract

The changes occurring in the retinas of women suffering from the acute toxic hypertensive syndrome of pregnancy, commonly called pre-eclamptic toxemia, have been noted by a number of observers. Evidence is presented from a number of investigators which indicates that in both the non-convulsive and convulsive forms of this syndrome there is a general systemic vascular change as revealed by a study of the precapillary vessels of the nail fold, the renal glomerular tufts, and the retinal arterioles.

Wagener has also stated that in cases of toxemia of pregnancy in which there is an associated rise in blood pressure, changes may be seen both in the retinal arterioles and in the retina proper. The changes in the arterioles appear first and those in the retina proper, commonly called "retinitis," are secondary to, and apparently dependent on, the changes in the arterioles. The caliber of the arterioles appears narrowed and the lumen is reduced, because of spastic contraction and increased tonus of the walls of the arterioles. This change in the arterioles may disappear entirely if there is early and permanent fall in blood pressure. The constriction soon becomes fixed if the toxemia progresses. When the constriction of any arteriole becomes so fixed and severe as to cause secondary capillary ischemia or stasis, localized edema and hemorrhage appear in the adjacent retina. If the toxemia continues, this spastic constriction may become so generalized and severe as to produce diffuse retinitis of albuminuric type, the classic "retinitis of pregnancy nephritis." The presence or absence, or the advancement, of the involvement of the arterioles can be determined best by frequent systematic examinations of the retina.

Wagener's description of the retinal changes in cases of pre-eclamptic toxemia may be divided into four consecutive stages, dependent on the severity and duration of the hypertension accompanying the toxemia: (1) The first visible sign is spastic narrowing of the arterioles of the retina, which may affect all branches of the central artery. (2) Often there is irregular constriction of the lumens of the arterioles, usually first or more marked in the smaller nasal branches; this constriction may vary in degree or situation from day to day. (3) Later, as the narrowing and constriction become more fixed, individual cotton-wool patches and hemorrhagic areas may appear in the retina. (4) Diffuse retinitis of albuminuric type may develop.

Ophthalmoscopic examination of the retina was made in 108 cases, in ninety-eight of which there were no convulsions and in ten of which there were convulsions associated with the acute toxic hypertensive syndrome of pregnancy, commonly called pre-eclamptic toxemia and eclampsia. During hospitalization of all patients but one, the systolic blood pressure was recorded at 140 mm. of mercury or more, and urinalysis revealed albumin grade 2 or more. In one case the highest blood pressure was less than 140 mm. systolic. Judged by the highest systolic blood pressure, the patients were classified in groups similar to those used by Peckham in his study of nephritis following acute toxemia; namely, group 1 included patients whose systolic blood pressure was between 140 and 169 mm. of mercury; group 2, those whose systolic blood pressure was between 170 and 199 mm.; and group 3, those whose systolic blood pressure was 200 mm. or higher.

Using the grading of 1 to 4, according to Wagener's description of the changes in the retinal arterioles and the retina proper in the toxemias of late pregnancy arranged according to the highest systolic blood pressure, it is shown in tables 1 and 2 and in Fig. 1, that: the severity of the changes demonstrated in the retina increased progressively with the height of the blood pressure. In group 1, only 12 per cent of the cases were graded as high as 2 or 3, and none were graded 4; in group 2, 48 per cent were graded 2, 3 or 4; and in group 3, 87.5 per cent were graded 3 and 4. One patient whose systolic blood pressure did not reach 140 mm., four whose systolic pressure remained under 150 mm., and ten others who had pressures remaining under 160 mm. had spastic retinal arteriolar changes. This is evidence that a generalized vascular disturbance rather than a local condition, such as lowered renal function, is present in association with the mild as well as the more severe forms of pre-eclamptic toxemia. In cases in which the systolic blood pressure was less than 180, no changes of acute retinitis grade 4 developed.

It may be assumed that there is an angiospastic change in the systemic arterioles similar to that which may be seen in the retinal vessels. If the spastic constriction is mild and of short duration, the arteriole will probably return to normal. If the spastic contraction is more marked and is maintained over a significant period of time, actual organic changes are prone to occur. This may affect vessels in one part or organ of the body more than another, and permanent damage may be done to the general vascular system or to the vessels of the brain or the heart or the glomerular tufts, which may fail to recover completely.

With this in mind, it is to be noted that the routine, regular sometimes daily, retinal examination of patients with the acute vascular syndrome of pregnancy is of practical value. As shown in table 4, labor was induced in forty-seven cases; the percentage of induction showed a rise parallel to both the rise in systolic blood pressure and to the severity of the retinal changes. In addition to readings of blood pressure, urinalysis and evaluation of the symptoms, changes observed in the arterioles of the retina furnish a valuable index of the degree of injury to the general vascular system and the rate at which this injury is

progressing. In a number of cases the change in the retina is the deciding factor in determining if, and when, to terminate pregnancy.

In 72 per cent of 103 cases in which the systolic blood pressure was 140 mm. of mercury or more, positive evidence was found of more or less change in the retinal arteries or in the retina proper. As a rule, changes in the retina which at first consisted of spastic narrowing of the retinal arteries, revealed a definite increase in degree and severity, with the increase in the height of the systolic blood pressure and the duration of the toxemia. The first appearance of cotton-wool exudates and hemorrhages in the retina indicates the danger of permanent arteriolar injury; in the presence of such retinal changes, pregnancy should be terminated promptly.

Discussion

Dr. W. H. Condit (Minneapolis): I thoroughly enjoyed this paper and wish to commend Dr. Mussey on this excellent survey. It recalls to memory a report before this Academy by Dr. William Murray several years before his death on the study of a series of patients with retinal changes in pregnancy. His series did not deal solely with patients in some degree of toxemia, but a group taken at random, including so-called normal pregnancies, if there is such an "animal." He found that practically every patient sometime during her pregnancy had some retinal changes that might to a greater or lesser degree affect her vision; but he left the impression with me that, even though my patients come in complaining of headache or slight disturbance of vision, I should have no great concern or make any change in their lenses if they are wearing glasses, in order to protect them or increase their comfort through that particular pregnancy; that Nature is very kind and sooner or later would restore the vision to normal after delivery.

So little is known of the cause of the various toxemias of pregnancy that we cannot feel disappointed that Dr. Mussey did not discuss the etiology of these retinal changes. Every pregnant woman changes in her physiological chemistry to a greater or lesser extent. I am reminded of one patient I had, who was in her first pregnancy. Within the first month of pregnancy her urine showed positive albumen. She had a history of a very severe scarlet fever in years past but had had no recent urinalyses, so I had no idea of the kidney function at the time of her marriage. She was an obstinate creature and would pay no attention to her diet. The albumen increased and her blood pressure began to rise. When it reached 200 systolic and her vision was practically gone, I felt that the uterus should be emptied. After consulting with her husband and parents they consented to induction of labor at seven months. At that time she was totally blind. She recovered and in about six months her vision was restored.

After that I was at Lying-In Hospital taking work with Dr. Markou. I told him about this patient and asked him when he thought it would be safe for her to conceive again. He said, at any time after her kidney repairs and blood pressure and vision returned to normal. He remarked that it might have been a beef steak or some specific food—in other words, a food allergy—that threw her off balance and started her in the toxic state. Afterward I delivered her of a boy and a girl two years apart. She escaped any untoward complications with both and had no hypertension or toxemic manifestations in either of these pregnancies.

Dr. R. T. LaVake (Minneapolis): This is a most interesting and stimulating paper. Nothing can be added from the standpoint of pathology in the retina but one may in discussion emphasize again the importance of watching for this retinal pathology as soon as we have the slightest suspicion of a beginning toxemia. This paper tends to strengthen the feeling of many of us that the advocates of non-intervention fail to consider the possible permanent damage to the mother even though one may be successful in saving the lives of mother and child. The case Dr. Condit mentioned redounds to the credit of his good judgment. He terminated pregnancy. Had he allowed the pregnancy to go on, as would the advocates of the non-intervention school, he might have lost mother and baby; or, instead of returning to normal, the mother might have been permanently damaged. I cannot help but feel that the advice given him regarding her future safety, though borne out by success in this instance, was over-optimistic. It has been my experience that patients showing retinal changes must be most carefully watched and checked before being advised that it is safe to become pregnant again.

Eye ground examinations at times furnish a clear indication for the advisable termination of pregnancy where blood pressure and urine indications are still not compelling. On the other hand, many of the worst cases of eclamptogenic toxemia show few if any eye ground changes, and this fact has led some men to minimize the importance of ophthalmoscopic examinations.

I would like to ask Dr. Mussey a question. Do I understand correctly that he considers retinal changes grades 1 and 2 are not in themselves an absolute indication for the termination of pregnancy, but that types 3 and 4 are absolute indications? Such a judgment would correspond to my experience.

Dr. Mussey (in closing): I wish to thank Dr. Condit and Dr. LaVake for their generous remarks. I think Dr. Condit is quite right in calling attention to the visual changes that a lot of pregnant women have. We were concerned here with the ophthalmic examination of toxemic patients. As far as etiology is concerned, nobody knows much about the toxic factor. Ophthalmologists who have more knowledge than I have about it, feel that the spastic constriction of the arteriole, if it lasts long enough, will produce ischemia and edema and hemorrhages in the retina and may proceed to retinitis; this spastic constriction may be the etiologic factor producing the changes in the retina.

We feel that changes in the retina are merely an index of what is taking place in the arterioles throughout the body and, if there are changes in the arterioles of the retina, there may also be similar changes and hemorrhages in other organs. We have had such patients as the one whose case Dr. Condit reports. I recall several years ago a young woman who had complete loss of vision due to edema and separation of the retina. Following delivery, vision returned to normal and she had two subsequent normal pregnancies. If patients have systolic blood pressures of 200 or more and the pressure remains greater than 200, in the large majority of instances arterial damage will be produced; if not to the kidney or the eye, to arterioles somewhere in the body.

In regard to Dr. LaVake's discussion about routine eye examinations, we find that the ophthalmoscopic examination is of definite value in the hypertensive toxemias of pregnancy. We do not feel that induction of labor is often indicated for the patient who has a grade 1 or 2 change in the retinal arteries because she has not yet begun to have cotton-wool exudates or retinal hemorrhages. If the blood pressure is extremely high or if the symptoms are severe, labor may be induced even when there are no ocular changes; but, in the presence of ocular changes, even with a lower blood pressure, we have learned that frequent examinations by the ophthalmologist may reveal hemorrhages in the retina. When retinal hemorrhages appear, one cannot say they have not occurred elsewhere in the body. For this reason, when the retinal lesions are advancing, or if retinal changes are reached up to grade 3 or 4, even if the blood pressure is no higher we proceed with measures to terminate the pregnancy.

PNEUMATIC RUPTURE OF THE BOWEL

Arthur W. Ide, M.D.
St. Paul, Minn.

In 1904 W. G. Stone of London reported the first case of pneumatic rupture of the intestines. Since that time, probably due to the fact that compressed air is being used more extensively, there have been more of these injuries reported. There have been forty-four of these cases reported in the literature up to date. This indicates the rarity of this accident. During the last three years, so far as is known, there has been none of these accidents, probably because of instruction of the danger and because of "safety first" agitation.

There have been three papers written besides several reports of cases. The first work on this subject was done by Dr. Willis Andrews. He reported one case of his own and collected other unpublished cases. The second paper appeared in 1914 by Bendixon and Blything. They reported one case of their own and collected seven other unpublished cases. Burt in 1931 reviewed this subject and brought the number of cases up to that date. He reported one case of his own and referred to three other unpublished cases. Burt also listed all the published cases. This brought the total number to forty-four. Burt and Andrews did a considerable amount of work to ascertain the amount of pressure necessary to cause this injury. They experimented on bowel removed from animals and from cadavers.

This communication of ours reports one case of our own and adds twenty-four other unpublished cases to the forty-four cases that have already been published. This brings the total number to sixty-eight.

Our case of pneumatic rupture of the bowel came under observation on Sept. 11, 1930. The victim was a car repairer employed by the Northern Pacific Railway. He was admitted to the hospital by ambulance at noon on Sept. 11, 1930. The patient stated that he had a sudden attack of abdominal cramps which came on while at work one hour earlier. His past history was normal. He had never had gastrointestinal disturbance of any kind. While X-ray pictures were being taken, the patient reluctantly admitted that earlier in the day he had turned the compressed air on a fellow workman and that at the time of the accident the fellow workman had retaliated by placing the nozzle of the hose near the patient's anus and released the air. This caused the severe cramps and, as the patient stated, "It filled me up with air." The cramps were soon followed by vomiting and urinary urgency.

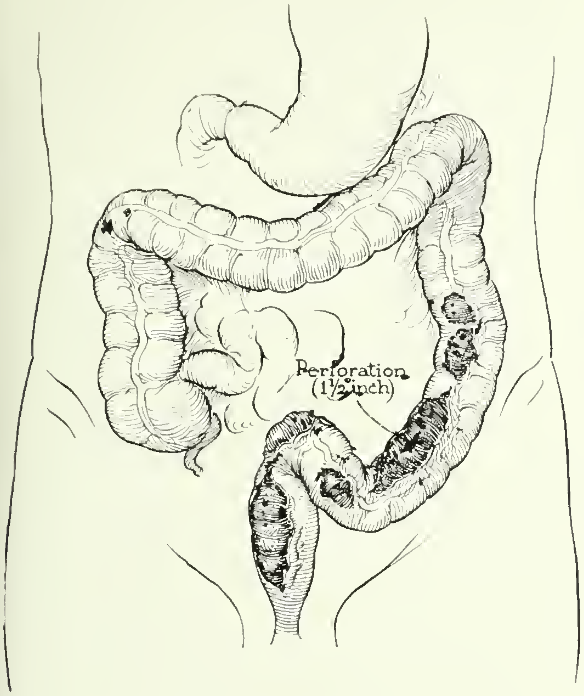
The patient presented a picture of a serious abdominal condition. His pain was intense. His face was pale and gave an anxious pinched expression. The abdomen was markedly distended and tympanitic. There was diffuse tenderness and board-like rigidity. His pulse and respiration were rapid. His white blood count was 10,600. A roentgenogram showed free gas under the diaphragm.

A diagnosis of pneumatic rupture of the bowel was made, and immediate operation advised.

The patient was operated three hours after the accident, under spinal anesthesia. The incision was along the outer border of the left rectus muscle. When the peritoneum was opened, gas escaped. The sigmoid was found perforated at about its mid point. In addition, there were extensive lacerations of the serous coat of the sigmoid and the descending colon. The damaged bowel was repaired. The peritoneal cavity was cleaned out as well as possible. Two flat rubber drains extended into the pelvis.

My first group of cases consists of four which occurred accidentally. They all died. Two of them were operated upon.

Case 1. With some other companions, L. F., age 12, was playing in the car shops of a railroad. They had been running and playing, and this boy got tired and sat down on the end of a pipe that was sticking out of the ground. One of the other boys, age about 12 years, kicked open the valve on the pipe. The pipe was connected with the compressed air apparatus and when the valve was kicked open the child was blown off. The end of the pipe was over the anus. The compressed air was introduced into the rectum and bowel. He was taken at once to the hospital where an emergency opera-



Sketch shows perforation of sigmoid with extensive laceration extending well up on the descending colon.

tion was performed, but he died the following afternoon. The rectum, sigmoid, and a portion of the descending colon were badly torn and ruptured.

Case 2. A machinist while at work was leaning over to adjust a nut. His fellow workman went behind him with an air hose and the nozzle came in contact with the patient's rectum. The patient immediately became violently sick. He was removed to a hospital and was operated at once. A tear was found in the lower end of the sigmoid about two and one-half inches long. The sigmoid above this tear was contused and the outer coat of the bowel was bruised. The patient died the following day.

Case 3. This patient was a machinist in the employ of a railway company. This is another case where the air hose in the hands of a fellow employee came near the victim's anus and the air was forced into the rectum under pressure. He sustained a rupture of the bowel and died. No operation.

Case 4. On February 1, 1920, a blacksmith helper, C. R., an employee of a railway company, was fatally injured when an employee accidentally put the nozzle of the air hose against the victim's rectum. The patient sustained a perforation of the bowel. In this case the patient died two days after the accident.

The second group of five cases occurred during the act of one man dusting another off with the use of the compressed air hose. Four of them died and one lived. Two of them were not operated upon.

Case 5. On Oct. 29, 1918, a boy 16 years of age, was working in a railroad shop together with other employees. He was cleaning up after a day's work and they were using compressed air to blow the dust off their clothing. The boy asked a negro to blow the dust off his clothing. The negro then applied the nozzle of the hose between the boy's legs, and the air penetrated the colon. He was taken immediately to the hospital but died shortly afterward. There is no record as to whether or not an operation was performed.

Case 6. (Dr. John R. Nilsson has furnished me with the following case.) G. D. was injured on May 30, 1926, when fellow employees were dusting off their clothing with compressed air. The nozzle of the hose was pointed at the victim's anus. He suffered cramps and distension. He was treated in the hospital where he died six days after injury. No operation and no autopsy.

Case 7. This patient was a machinist helper, age 21, and was injured on June 1, 1914. A fellow employee was brushing him off with an air hose. The nozzle of the hose was placed near the anus and the air was forced into his rectum causing a rupture of the bowel. The patient was operated upon but died the following day.

Case 8. A boilermaker in the employ of a railway company was blowing the dust off the coat of a fellow workman at the latter's request. In doing this the nozzle of the air hose was placed near the rectum while the victim was bent over. The injured man sustained a perforation of the bowel and died shortly afterward from shock.

Case 9. On July 15, 1929, H. W., a railway employee, was injured when the nozzle of an air hose was directed against the anus by a fellow employee when he was dusting him off. The resulting injuries, due to forcing compressed air into the rectum, were not of a serious nature. The patient returned to work ten days after the accident.

The third group of thirteen cases occurred as an example of pranks or "horse-play." Three of these lived and ten died.

Case 10. (This case was reported in the Bulletin of the Moses Taylor Hospital, Scranton, Pennsylvania. It occurred in the service of Dr. J. M. Wainwright, to whom I am indebted.) The report reads as follows: "The patient, an oiler in a car shop, was climbing up a ladder. A second workman held the nozzle of an air hose against his anus and turned on the air pressure. The air hose nozzle was 3/8ths of an inch in diameter and had about ninety pounds of pressure back of it. He does not remember whether the nozzle was pressed against him, but thinks in having his thigh flexed on the ladder the air was able to enter more easily. He was wearing overalls, trousers and underwear, with no holes in any of them. He felt a sudden severe pain immediately when the air was turned on, and he says he could feel the air filling up his abdomen. His fellow workman walked him about hoping to remove some gas, and then put him in an automobile and gave him a ride as their first treatment had not been a great success. He was seen two hours after the injury. The abdomen was very unusually hard, much harder than in the average case of peritonitis. Owing to failure to appreciate the possibilities, the patient was given a turpentine enema. An operation was done six hours after the injury. When the peritoneum was opened, there was a loud escape of gas under high pressure, almost as loud as the report of a small automobile tire. The patient was given appropriate treatment and recovered."

Case 11. This patient was a car cleaner. While bending over to see if the car windows were closed, a fellow employee stuck the nozzle of an air hose near his anus. He was taken to the hospital immediately after the injury and was operated upon. Lacerations were found around his rectum and emphysema of the entire abdominal wall and side. A rupture of the colon and sigmoid was found. The patient made a good recovery.

Case 12. This employee was engaged in pressing grease into cakes and was working in a stooped-over position when a fellow employee held the nozzle of a compressed air hose at or near the anus. Immediately the patient was seized with pain in the abdomen and fell to the floor. Air was aspirated from the abdomen. He died five hours after the accident. No operation was performed.

Case 13. In this case a fireman on a locomotive placed an air hose against the anus of the engineer. The engineer was leaning out of the cab window looking ahead. There was a rip in the engineer's trousers, and the force of the air pressure literally blew this man up like a balloon. The patient lived about 24 hours and then died. No operation.

Case 14. This patient was another railway employee. An air hose was held near the victim's anus and a rupture of the bowel was sustained. The patient died shortly afterward.

Case 15. On May 30, 1936, an engine watchman sustained a rupture of the bowel due to compressed air. The accident occurred as the result of horse-play. The injured man died. There is no further record.

Case 16. Mr. P., a mechanic in the employ of a motor truck company, was killed by an air hose accident. This was another case of horse-play, and the accident occurred in the same manner as the preceding case.

Case 17. This man, A. L., was fatally injured in the same way as practically all of these victims. A fellow employee applied the nozzle of an air hose against his rectum, with resultant rupture of the colon. The patient died from shock and peritonitis.

Case 18. On March 24, 1915, a railway employee was injured as a result of horse-play with compressed air. The compressed air entered the rectum and ruptured the walls of the rectum. The victim died three hours after the accident.

Case 19. On June 21, 1915, J. H., an employee of a foundry company, was fatally injured when during horse-play a fellow workman applied an air hose to his rectum.

Case 20. On June 15, 1920, a foreman, as a practical joke, applied the nozzle of an air hose to the anus of one of his employees. The victim sustained a perforation of the colon from which he died eight days later. There is no record of operation.

Case 21. On July 31, 1936, a car repairer received injuries to his intestines while a fellow employee held an air hose against the anus with 90 pounds of pressure. As in practically all these cases, there was marked distension of the abdomen with severe pain and extreme shock. This man was operated, and died during the operation.

Case 22. An employee was injured by compressed air entering the anus. The injuries were minor and no disability resulted.

The fourth group consists of three cases which are not given in detail. These all died.

Case 23. This case occurred in the plant of a cereal company. No details are available, but the result was fatal.

Case 24. This is a case of rupture of the sigmoid due to the application of compressed air. The accident occurred in Atlanta, Georgia. No details are available.

Case 25. A fatal injury occurred to an employee of a railway finishing material company. No details available.

We made some effort to investigate the experience of oil companies at their filling stations. One officer writes, "I have recently heard indirectly of a small boy who suffered this accident as the result of a practical joke with an air hose at a filling station with a fatal result. I do not know the details of this case nor how I can find them out."

We have a personal letter from the law department of one of our largest gasoline retail companies on this matter. They say they have never heard of such an accident. Probably the construction of the air nozzle at these filling stations is a great protection. However, undoubtedly these accidents have occurred at filling stations.

Compressed air is used extensively in industrial work for the purpose of transmitting power to drills, riveters, and other machinery. It is also used for cleaning the debris from inaccessible places as well as for paint spraying and sand blasting. The compressed air, under pressure of from 40 to 125 pounds, is piped to numerous places in industrial plants. The average person seems to have no comprehension of the danger of this force. It does not occur to them that there is any risk in directing this column of air against the body of another person. There appears to be some psychological force that impels these men to direct this column of air at a vulnerable part of the body, namely the anus. Out of 25 cases, thirteen were definitely due to horse-play.

These victims were all fully clothed and the compressed air was forced through the clothing and into the rectum even though the nozzle of the hose was in some cases several inches from the anus. This is accounted for by various writers in two ways. In the first place, air under pressure from 100 to 125 pounds issuing from a hose, forms a solid column of air which acts as a solid body forcing open the sphincter muscles. In the second place, anatomical arrangements of the perineum are such that it acts much like a funnel in concentrating the air column at the anus. We might add that air under heavy pressure easily penetrated the smaller openings in clothing. The clothing does not seem to act as an obstruction in the column of air.

The column of compressed air emerging from the hose in these injuries finds the anal sphincter the point of least resistance and does very little damage on the outside. The real pathology is inside and concealed. For this reason, without an accurate history, most cases are considered as possible acute perforations from an ulcer or severe "colic" due to some other cause. It is interesting to note that a large number of these cases have been given an enema very early after admission. Marked distension of the peritoneal cavity with air is a characteristic feature of these cases. The presence of air can, of course, be demonstrated with the X-ray.

In every case reported, the colon has been the viscus which has been torn or perforated. The sigmoid is in most cases the point of election for complete perforation. Usually there has been only one complete perforation of the colon with multiple tears of the outer coat of the bowel with bulging of the mucous coat. The reason for this perforation of the sigmoid, as Andrews has pointed out, is probably because the sigmoid flexure offers an added resistance to the air passing through the rest of the colon, and thus yields first to the unequal pressure. In most cases reported, the site of perforation and laceration is at the longitudinal band.

In this series of 26 unpublished cases, eighteen were fatal, five recovered, and in two cases we were unable o ascertain whether or not the patient had recovered. This is a high mortality rate and corresponds to Dr. Andrews' figures of 81.2 per cent.

As far as we could determine definitely, seven of the cases here reported were operated upon. Only five of he entire number of cases reported recovered. This would indicate that immediate operation is rewarded with favorable results and would markedly lower the mortality percentage.

The treatment of pneumatic rupture of the bowel is immediate laparotomy with repair of the lacerated bowel with drainage. In nearly every case reported, the rupture and laceration takes place in the sigmoid so that very little time need be wasted in exploration. For the same reason, the best approach is through the left rectus incision. In cases with enormous distension, resulting shock, and depression due to pressure, a needle may be inserted into the peritoneal cavity to gradually decrease the pneumatic pressure and relieve the patient o such an extent that operation may be successfully performed.

Conclusions

1. Clothing offers little resistance to air under pressure.

2. Rupture of the bowel is usually in the sigmoid with laceration of the outer coat of the colon.

3. Victims of this accident are apt to attempt to conceal the cause and thereby mislead the surgeon unless he bears in mind the possibility of pneumatic perforation.

4. Gradual release of intraperitoneal air pressure by means of inserting a hollow needle into the peritoneal cavity may be used to advantage to relieve shock and improve the patient as an operative risk. This may also be used as a diagnostic procedure.

5. Prompt diagnosis and early laparotomy offer the only chance of saving life in injuries of this nature.

6. The increasing use of compressed air in industrial work and its misuse by employees has increased serious and fatal accidents.

7. Strict rules covering the use of compressed air are in general use. Employees are promptly disciplined for any breach of these rules.

8. These are all potential claims. As far as we know, there has been no criminal action in connection with them.

Discussion

Dr. H. P. Ritchie (St. Paul): I might add a case to this group. The story is the same as those recited by Dr. Ide. A workman in a shop was bending over and another man placed an air hose near the anus. The man immediately dropped over, but recovered sufficiently to be taken home. There he was given a soapsuds enema which did not return. Another enema with a liberal quantity of turpentine was given and when this did not return, a doctor was called to the home and, appreciating the situation, sent the man to St. Luke's hospital. He came into the hospital about six hours after the injury with the most remarkable abdominal distension I think I have ever seen. At operation both enemas were recovered. It was quite an experience to open that abdomen and be almost overcome with the odor of turpentine. A slit was found in the sigmoid which was closed, the abdomen drained and the man recovered.

The cases of compressed air injury to the bowel are in the same class as any other case of traumatic rupture. The peritoneum stands all kinds of insult with recovery providing the irritation is not present too long. The time element between injury and treatment is the most important factor in recovery.

Dr. Ide, in closing: The workers in these shops are pretty well protected. Supervisors are very strict and do not allow any play or joking because, if they do, the men get into trouble. Any man playing around with any machine would be disciplined very severely.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

NEWS ITEMS

A new general hospital has been opened at St. Peter, Minn., with Mrs. Hughes, R.N., in charge.

Dr. Hugh Cabot, formerly of the Mayo Clinic, Rochester, Minn., is now located at Jamestown, N. D.

Dr. D. Lemisux, formerly of Dunseith, has located at Stanley, N. D., and will continue general practice.

Dr. J. D. Bailey, Los Angeles, Calif., has joined the staff of the Midwest Clinic, at Rapid City, S. D.

Dr. H. E. Sims, formerly of Roscoe, S. D., has moved to Bastrop, La., where he will continue his general practice.

Dr. F. M. Archibald, one of the pioneer physicians of Mahnomen, Minn., passed away last month at the age of 70 years.

Dr. Charles F. Watkins, one of the prominent surgeons of Billings, Mont., died March 5th from a sudden attack of bronchial pneumonia.

Dr. L. M. Roberts, Little Falls, Minn., who suffered a fracture of his left shoulder and three ribs in an airplane crash, is recovering from his accident.

Dr. O. G. Way, Claremont, Minn., who has been in active practice for over 50 years, died on February 24, the result of a sudden attack of paralysis.

Laporte, Minn., and Portal and Sherwood, N. D., are all without physicians at the present time. These are good locations for a young physician.

Dr. B. F. VanValkenburg, Long Prairie, Minn., has sold his hospital and practice to Drs. M. E. Mosby, Browerville, and B. L. Gifford, of Hewitt, Minn.

Dr. M. G. Ericsson, formerly of Chicago, and a graduate of the University of Minnesota, has opened offices for general practice at Long Prairie, Minn.

Dr. J. P. Widneyer, who has been in active practice at Rolla, N. D., for over 40 years, has been made an honorary life member of the Devils Lake District Medical Society.

The March meeting of the Seventh District Medical Society, held at Sioux Falls, brought out a large attendance of members. Dr. A. F. Tyler, Omaha, was the guest speaker.

Dr. A. D. McCannel, Minot, N. D., will be one of the leading speakers at the annual meeting of the Canadian Medical Association, to be held at Victoria, B. C., in June.

Dr. L. J. Panko, Sioux Falls, S. D., was the principal speaker at the annual founders' day banquet of the Phi Chi medical fraternity at the University of Minnesota last month.

Dr. W. J. Richardson, who has been in active practice at Fairmont, Minn., for over 45 years, died at his home on February 22. The doctor was a graduate of Harvard University.

Dr. J. A. Myers, Minneapolis, was the guest speaker at the March meetings of the Tuberculosis Society at Chicago and the Iowa Tuberculosis Association at Fort Dodge.

Dr. Kenneth L. Matson, Aberdeen, S. D., was a recent graduate of the Rush Medical School, Chicago. Dr. Matson will remain in Chicago for a year at one of the leading hospitals in that city.

Dr. L. H. Fligman, Helena, president of the Montana State Medical Association, was in Detroit, Mich., last month, attending a clinical meeting sponsored by the American College of Physicians.

Dr. C. L. Scofield, Benson, Minn., who has so faithfully served that community for nearly 50 years, was honored with a testimonial banquet by over 250 members of the Civic Association of that city.

Dr. Alano E. Pierce, Minot, N. D., died on March 16 after an illness of only a few days of pneumonia. Dr. Pierce was 35 years of age, a graduate of the University of Minnesota in the class of 1924.

Dr. E. J. Tanquist, Alexandria, Minn., head of the Douglas County hospital, returned recently from Chicago where he spent several weeks at the Cook County Graduate School in the study of Urology.

Dr. G. M. Williamson, Grand Forks, N. D., was a caller at The Journal-Lancet office last month, on his return from a Chicago trip, where he attended the annual meeting of the American Congress on Medical Education.

Dr. Joseph B. Gaida has become associated with Drs. J. J. Gelz and W. T. Wenner in the practice of Eye, Ear, Nose and Throat, in St. Cloud, Minn. Dr. Gaida was graduated at the University of Minnesota in 1931.

At the annual meeting recently held at Minot, N. D., of the Northwest District Medical Society, the new officers elected are: Dr. P. H. Rowe, Minot, president; Dr. S. J. Hillis, Berthold, vice-president, and Dr. J. R. Pence, Minot, secretary.

Dr. Charles N. Spratt, Minneapolis, left recently for the South. He will demonstrate, by means of motion pictures, his methods of operating for cataract and glaucoma before the Ophthalmological Societies at Louisville, Nashville and Atlanta.

The North Dakota Sixth District Medical Society recently held its annual meeting and elected new officers, with Dr. L. G. Eastman, Hazen, as president; Dr. G. M. Constans, Bismarck, vice-president, and Dr. L. W. Larson, Bismarck, secretary.

Rochester, Minn., is the "most doctor-ridden" city in the United States, according to statistics recently printed. With one doctor to every 68 residents, it far outshines New York City, Chicago, Boston, and Cleveland in the number of doctors to possible patients.

Diseases of the circulatory system—heart disease and apoplexy—killed 134 South Dakotans during January, Dr. H. B. Jenkins, superintendent of the state board of health, reported. Heart disease was blamed for 92 of these deaths and apoplexy the remaining 42.

The annual meeting of the North Dakota Hospital Association was recently held at Fargo, when they elected new officers: Mr. J. T. Tollefson, Fargo, president; Mother Gilbertson, Jamestown, first vice-president, and Mother Cammilus, Valley City, second vice-president.

Dr. Verner P. Johnson, who has been in active practice at Delano, Minn., for the past ten years, died at a Minneapolis hospital on March 19th after a short illness. Dr. Johnson was president of the Wright County Medical Society, and a graduate of the University of Minnesota.

Dr. F. M. Mann, professor of experimental surgery of the Mayo Clinic, Rochester, gave the third annual address of the Dr. E. Starr Judd lectureship in the auditorium at the University of Minnesota last month. Dr. Mann's topic was "Hepatic Physiology and Its Relation to Surgery."

In recognition of the fifty years of service that has been spent at Benson, Minn., by Dr. C. L. Scofield, the Chamber of Commerce of that city extended the doctor a testimonial dinner which was attended by over 250 friends and patients. Through all these years, Dr. Scofield has been a leader in all civic and medical affairs.

Charles P. Sigerfoos, Ph.D. professor emeritus of zoology at the University of Minnesota, was guest of honor at a dinner given recently by the Hennepin County Medical Society at the society's quarters, Medical Arts building. At the group's regular meeting following the dinner, Dr. Sigerfoos presented a paper on "Present Status of the Evolution Doctrine."

In the death of Mrs. Peabody, wife of Dr. P. D. Peabody, of Webster, the South Dakota Medical Auxiliary have lost one of its most prominent and conscientious workers, always ready and willing to do her part in the work of the auxiliary. She served as president for two years, and will be sadly missed by a large circle of loyal friends.

The Minnesota State Medical Association broadcasts weekly at 10:00 A. M. every Monday over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: April 6, "Hay Fever"; April 13, "Rheumatic Fever"; April 20, "Narcolepsy"; April 27, "Sore Mouth."

Dr. Helena Knauf Wink, Jamestown, N. D., aged 81, one of the most widely known and most beloved physicians and surgeons in the Northwest, died at a local hospital February 18, her death caused from burns sustained while cleaning clothes at her home. Dr. Wink has been actively engaged in the practice of medicine in Jamestown since August, 1883, when she came to the city from Ann Arbor, Mich., where she was graduated from the school of medicine in June, 1883.

Mrs. Ida Bare entered a plea of guilty on March 4, 1936, before the District Court of Ramsey County, Minn., to an information charging her with the crime of abortion. Judge Walsh sentenced her to a term of not to exceed two years at hard labor at the Women's Reformatory at Shakopee. Mrs. Bare, who had no medical training except a little knowledge gained as a practical nurse, attempted to perform an abortion on a 32-year-old St. Paul woman. The uterus was punctured by the use of a catheter, resulting in the almost instantaneous death of the patient.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON FEBRUARY 13, 1936

BY EXAMINATION

Name	School	Address
Balkin, Samuel George	U. of Minn., M.B., 1935	1011 Sheridan Ave. N., Minneapolis, Minn.
Batts, Martin, Jr.	U. of Mich., M.D., 1933	Mayo Clinic, Rochester, Minn.
Bell, Elexious Thompson	U. of Missouri, M.D., 1903	526 7th St. S. E., Minneapolis, Minn.
Blake, James Alexander	U. of Minn., M.B., 1934, M.D., 1935	Hopkins, Minn
Bryce, William Fielding, Jr.	Med. Col. of Va., M.D., 1934	Mayo Clinic, Rochester, Minn.
Bussey, Charles Dan	Rush Med. Col., M.D., 1934	Mayo Clinic, Rochester, Minn.
Campbell, Samuel Joseph	Tulane U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Chew, Eric MacMillan	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Cohen, Bernard Albert	U. of Minn., M.B., 1934	1210 Newton Ave. N., Minneapolis, Minn.
Crisler, George Russell	U. of Chicago, M.D., 1931	Mayo Clinic, Rochester, Minn.
Deeds, Charles Douglas	U. of Cincinnati, M.D., 1934	Mayo Clinic, Rochester, Minn.
Dennis, Clarence	Johns Hopkins, M.D., 1935	University Hospital, Minneapolis, Minn.
Eckstein, Arthur W.	Northwestern, M.D., 1912	Mankato, Minn.
Elkins, Earl Cook	Geo. Washington U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Fairchild, Robert Durkee	Rush Med. Col., M.D.. 1934	Mayo Clinic, Rochester, Minn.
Farthing, John Watts	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Friedell, Hymen Louis	U. of Minn., M.B., 1935	1709 Russell Ave. N., Minneapolis, Minn.
Garrett, Leslie Moyers	Vanderbilt U., M.D., 1933	Ancker Hospital, St. Paul, Minn.
Guernsey, Chester Meredith	U. of Minn., M.B. & M.D., 1934	Mayo Clinic, Rochester, Minn.
Gunderson, Harold Julian	Northwestern U., M.B., 1933, M.D., 1934	Mayo Clinic, Rochester, Minn.
Hall, Byron Ellsworth	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Hammar, Lawrence Michael	U. of Minn., M.B., 1935	Minneapolis General Hospital, Minneapolis, Minn.
Heffner, Reid Russell	Johns Hopkins U., M.D., 1931	Mayo Clinic, Rochester, Minn.
Ingham, Donald William	Temple U., M.D., 1933	Mayo Clinic, Rochester, Minn.
Jacobs, Lewis Grant, Jr.	Stanford U., M.D., 1932	University Hospital, Minneapolis, Minn.
Kerr, Jack Graves	Baylor U., M.D.. 1931	Mayo Clinic, Rochester, Minn.
Koschnitzke, Herman Kaiser	U. of Minn., M.B., 1935	Minneapolis General Hospital, Minneapolis, Minn.
Leemhuis, Glenn H.	U. of M., M.B., 1935	1684 James St., St. Paul, Minn.
Lemon, Robert George	U. of Illinois, M.D., 1935	Mayo Clinic, Rochester, Minn.
Lovelady, Sim Bedford	Tulane U., M.D., 1934	Mayo Clinic, Rochester, Minn.
MacKenzie, Walter Campbell	Dalhousie U., M.D.. 1933	Mayo Clinic, Rochester, Minn.
Maksim, George, Jr.	Temple U., M.D., 1933	Mayo Clinic. Rochester, Minn.
Mareley, David McMillan	U. of Minn., M.B., 1934, M.D., 1935	Mayo Clinic, Rochester, Minn.
McEwan, Alexander	U. of Pittsburgh, M.D., 1933	Mayo Clinic, Rochester, Minn.
McLennan, Charles Ewart	U. of Minn., M.B. & M.D., 1934	University Hospital, Minneapolis, Minn.
Medof, Sidney Howard	U. of Minn., M.B., 1935	Minneapolis General Hospital, Minneapolis, Minn.
Murphy, Edmund Patrick	McGill U., M.D., 1935	2915 Glenhurst Ave., Minneapolis, Minn.
O'Brien, William Martin	St. Louis U., M.D., 1933	2147 Grand Ave., St. Paul, Minn.
Pearson, Malcolm Montieth	U. of Minn., M.B., 1935	Minneapolis General Hospital, Minneapolis, Minn.
Peterson, Stanley Carl	U. of M., M.B., 1935	2830 Cedar Ave. S., Minneapolis, Minn.
Reimann, Hobart A.	U. of Buffalo, M.D., 1921	University Hospital, Minneapolis, Minn.
Richey, Granville Leon	Indiana U., M.D., 1934	Mayo Clinic, Rochester, Minn.
Riley, John Branson	U. of Minn., M.B. & M.D., 1934	Co. 4716, C.C.C., Big Fork, Minn.
Rhorer, Roger Jerome	Northwestern U., M.B., 1933, M.D., 1934	Mayo Clinic, Rochester, Minn.
Rosenberg, Edward Frank	Jefferson Med. Col., M.D., 1934	Mayo Clinic, Rochester, Minn.
Shelden, Charles Hunter	U. of Pa., M.D., 1932	Mayo Clinic, Rochester, Minn.
Simpson, Wyatt Collier	Harvard U., M.D., 1931	Mayo Clinic, Rochester, Minn.
Smith, Caleb Howard	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Snyker, Omer Edward	Loyola U., M.D., 1935	Co. 3708, Ely, Minn.
Soderstrom, Edwin Morris	Stanford U., M.D., 1931	Mayo Clinic, Rochester, Minn.
Stone, Samuel Newton, Jr.	U. of Pa., M.D., 1932	Mayo Clinic, Rochester, Minn.
Weiner, Harry	U. of Minn., M.B., 1932, M.D., 1933	Station Hospital, Fort Lincoln, N. D.

BY RECIPROCITY

Name	School	Address
Ferguson, William Cyril	U. of Neb., M.D., 1934	1515 Charles St., St. Paul, Minn.
Krusen, Frank Hammond	Jefferson Med. Col., M.D., 1921	Mayo Clinic, Rochester, Minn.

NATIONAL BOARD

Name	School	Address
Birge, Henry Leonard	U. of Pa., M.D., 1933	Mayo Clinic, Rochester, Minn.
Hedlund, Charles John	U. of Wash., Mo., M.D., 1934	Cambridge, Minn.
Rice, Hagbart Goetz	U. of Minn.. M.B. & M.D., 1935	Moorhead, Minn.

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New Series

From Childhood Infection to Adult Type of Pulmonary Tuberculosis*

Prof. Arvid Wallgren, M.D.
Gothenburg, Sweden

THE concept of the mode in which tuberculosis of the lungs originates has traveled many peculiar ways during the past. The oldest and still common observation of infection occurring in families and their relations led the older school of doctors to the supposition, that consumption was dependent on hereditary disposition. At that time Villemin had not yet shown the transferability of tuberculosis from man to animals, and von Koch had not made his discovery of the tubercle bacillus. When this occurred a fairly abrupt change took place in the concept in the minds of the physicians. Just as convinced as they had been previously that the seed of the disease was hereditary, it now became equally clear that this seed was transferred from the sick person to those he contacted. Here, then, was the unsought explanation for the tendency of tuberculosis to appear as a familial disease. If one member of the family had consumption, then the rest became infected, and the infected one became afflicted with tuberculosis. Without infection no consumption developed. Thus began the consumption-panic, a period during which consumptives were shunned like the plague, and no one dared to come near them.

It did not, however, take many years before a reaction set in. Experience disclosed the results of association between healthy people and consumptives. It was certainly true that infection could lead, and earlier or later often did lead, to consumption in the infected, but more and more cases became known where intimate association with the consumptive did not result in disease. Doctors and nurses subjected in daily work to the risk of infection remained healthy in spite of this. Except in few cases married people did not transmit the disease to one another. What should one believe? In some cases sickness followed infection; in other cases no disease resulted from certain infection. Thus heredity and disposition again came under discussion and, it was asked, if in order to have tuberculosis of the lungs, partly infection and partly hereditary disposition were required.

A series of observations during experimental investigations of tuberculosis, and particularly clinical experiences won through diagnostic use of tuberculin, however, re-opened the phthisiogenetical problem. A new factor, which earlier had not received much attention was added: acquired immunity to tuberculosis.

Experimental investigation on divers laboratory animals had clearly demonstrated that tuberculous inoculation after a time resulted in increased resistance to later inoculations. Successful survival after the primary tuberculous infection made the animal less susceptible to later infections. Through the primary infection the animal had acquired a relative immunity to tuberculosis.

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*Written especially for the Pediatric issue of THE JOURNAL-LANCET. Translated from Swedish by Dr. C. G. Arvidson, Minneapolis.

Before the diagnostic use of tuberculin there existed only a vague idea of the spread of tuberculosis viewed as an infectious disease. It is true that careful postmortem examinations on non-selected material had established that tuberculous changes often occurred as accidental findings, in some statistics approximating 90 per cent of all examined. Following the introduction of diagnostic tuberculin tests, the possibilities of diagnosing antecedent tuberculous infection were greatly enhanced. From various sources statistics were published on tuberculin sensitivity and through these a surprisingly high frequency of infection was shown. From a zero percentage at birth there was a steep rise in the infection-rate, and in certain of the larger cities this had attained an incidence of 100 per cent at the age of puberty. An adult person living in a large city was axiomatically considered tuberculous, and with only few exceptions the infection had taken place during childhood.

Experimental studies on tuberculosis which tended to show the presence of a relative immunity to tuberculosis in those infected, together with the experience of high frequency of infection in the case of apparently healthy individuals, showed that certain adults could expose themselves to infection from consumptives without risk. An adult who during childhood had passed through his primary infection, was relatively immune, therefore, to new tuberculous infection. Some support for the correctness of this reasoning was derived from observations on the course of tuberculous infections in adults among primitive races, who previously had not come in contact with tubercle bacilli. In these the infection called forth a virulent, febrile lung-tuberculosis shortly resulting in death. The disease ran its malignant course, it was supposed, because acquired immunity gained through a childhood infection was lacking. Consequently a primary tuberculous infection during adult years was, therefore, looked upon as very dangerous, and the risk for progressive lung tuberculosis was considered great. It was not remarkable under such conditions, that childhood infection began to be regarded as an advantageous phenomenon. It was reasoned that during childhood it was easier to overcome the primary tuberculous infection, and also that through this a protective immunity had been acquired against tuberculous infection during adult years.

The circumstance that those who had been infected during childhood could acquire tuberculosis of the lungs after puberty was thought to depend on the assumption that the acquired immunity for some reason had become impaired and the bacteria again had gained the upper hand. Lung-tuberculosis is, said von Behring, the harvest of the grain, the seed of which was sown during childhood. The fear surrounding tuberculous infections began to diminish. The panic of consumption was written off. This in general was the pre-war conception of the origin of lung tuberculosis.

During and after the war observations were made that overthrew these hypotheses of a universal childhood infection, immunity developed through such, and the harmlessness of exogenous reinfections. New investigations on the frequency of infection during different ages indicated that children certainly were not tuberculin-positive to the extent that earlier investigations had shown and the results of which had been generalized. Half or more of all people, even in the larger cities, left childhood behind without having become infected, and among the rural population the percentage of infection was still less. In spite of this lowering of frequency of childhood infection a greater number of adult cases of tuberculosis than previously did not occur. Observations were also made of the latter destinies of those infected during childhood (Frölich, Myers) which shook the belief in the beneficial influence of childhood infection. Those infected during childhood became ill more frequently during adult years with post-primary lung tuberculosis and other tuberculous disease manifestations than those not infected at the same starting point. Doubts with reference to the hitherto trusted immunity, which animal experimentation had proved, became more frequent.

The reasons for doubting the correctness of the earlier concept became greater as observations on the occurrence of lung tuberculosis in previously infected persons following exposure to certain reinfection risk multiplied. To this was added some observations on not hitherto known or sufficiently heeded types of tuberculous lung processes ("Frühinfiltrat," Assmann, Redeker, et al.), which in their subsequent development sometime were spontaneously resorbed or led directly to the classical type of phthisis. These infiltrations were thought to depend on reinfection derived usually from the outside, but an endogenous reinfection was not considered excluded. The childhood infection, whose relative immunity was insufficient in degree to protect against these infections, had largely no other significance than constituting the source of these pulmonary infiltrations. In some quarters, particularly in the U. S. A., another unfavorable effect of childhood infection was taken into account: An alteration in reaction to tubercle bacilli on the part of the organism as engendered by the primary infection, now known under the name of allergy, was a prerequisite in order that the classical form of lung tuberculosis should develop after a reinfection.

First regarded as a favorable phenomenon, child infection now, at least in some quarters, came to be considered as something that in every way should be avoided. These new theories, for as such they must as yet be regarded, misled many into extremes, with reference to their attitude to the practical consequences of the new concept. Exogenous reinfections, for example, were regarded so dangerous for consumptives cared for in sanatoria that these patients ought to be isolated in private rooms, or if such were lacking, that some form of segregation be employed according to abundance of bacilli (Braeuning).

It is true, however, that not all phthisiologists share this concept of the detrimental effect of childhood infection on the origin of consumption whose most intensive spokesmen doubtlessly are Redeker and Myers. There are representatives for a diametrically opposite concept: the infection plays a very slight if any role in the phthisiogenesis, and it is heredity that gives the decision (Lumiere). Those who have helped to establish the theory preceding the one referred to here are unwilling to abandon a view, for the correctness of which, their experience seemingly has given sufficient support (Hamburger et al.).

In the present article it is my intention to scrutinize and evaluate some of the premises on which these antagonistic opinions of the origin of lung tuberculosis rest. I will try to show that it is possible to bridge the existing cleavages of opinion. For this there is necessary a weeding out of exaggeration, separation of proven facts and hypothetical constructions, avoidance of expressions and ideas that may seem aprioristic or point in the wrong direction.

An important point on which opinions differ is with reference to immunity. The pre-war conception was that the primary infection called forth a relative immunity to tuberculosis which protected against reinfections. The newest conception asserts that, if immunity is at all developed by a primary infection, then in all instances, this is so slight that it lacks importance. The former point to consistent and proven investigations on experimental animals and practical experience showing that tuberculin positive children may without evident risk associate with consumptive people. The latter point to the results of re-examinations of tuberculin-positive children likewise unquestionably showing that these oftener than others become sick and die from tuberculous diseases.

The remarkable thing is that both these diametrically opposite opinions are relatively correct. They do not speak of the same thing. When the former talk of immunity, they mean above all acquired specific resistance toward extrinsic, exogenous reinfections. When the latter deny that acquired immunity exists, they have in mind particularly the activity of tubercle bacilli already present in the body. The former have shot over the mark in that they too unreservedly have made immunity to apply even, and possibly in just as high degree, to endogenous tubercle bacilli. The latter have been misled from their experiences of absence of immunity toward tubercle bacilli in the body to deny an immunity even towards exogenous reinfections.

The spokesmen for both concepts as a rule overlook the difference that exists between immunity towards exogenous reinfections and immunity towards the virus which has already produced pathological changes in the body. There is, or can at least be, a question of two widely separated and independent phenomena. We do not have to go further to find an analagous situation than to the other chronic infectious disease, syphilis, which in this, as in other particulars, acts like tuberculosis. A syphilitic person is immune towards reinfections, but the luetic disease he carries if he remains untreated, can at the same time irresistibly progress and put him in the grave. A syphilitic has in other words specific immunity towards reinfection, but the syphilitic infection does not create an effective specific immunity with reference to itself in the diseased body.

The immunity to exogenous reinfections, which demonstrably is present in tuberculosis, is, however, in contrast with syphilis, as judged from animal experimentation, only relative in nature. To judge from my own and the experience of certain other physicians it still looks as if under ordinary conditions this would be enough to protect a tuberculin positive child from appreciable risk, if the child is subjected to new possibilities of infection. Under some unfavorable circumstances this relative immunity can, however, be broken through, and reinfection take place. According to my personal experience this occurs very seldom during childhood, at least before puberty. During more than two decades I have sought for proven cases of reinfection, but out of many thousands of children infected with tuberculosis who provenly without the least risk have resisted new tuberculous infection, I have not seen a single case where an exogenous reinfection demonstrably has taken place.

The question discussed here of the existence of acquired specific immunity toward exogenous reinfections and the absence of noteworthy specific resistance toward the virus of the primary infection, throws light on the old concept of childhood infection as a favorable phenomenon. Is it advantageous to have passed through a primary infection? To this can be answered both yes and no. If it would be possible throughout life to avoid with certainty the risk of a virulent infection, then this of course is best. In this way is avoided with absolute certainty all tuberculous diseases, thus even the most feared consumption. Is it possible to attain this objective? If we compare older and present day statistical investigations of the frequency in different ages of tuberculous infections, we will generally find, as was indicated, a fairly essential difference. In contrast with earlier times, when at least in the larger cities all persons were shown to be infected before puberty, it is found in our time that at least 50 per cent of the same category of people are not infected on leaving childhood behind. If the situation is followed into the higher age groups, it is found, however, that in the cities gradually only a minority escape infection. There is, therefore, a quite definite displacement upward of the age of infection. There is a clear and fairly general tendency showing that in the future we may have a right to hope for the possibility that most people will escape tuberculous infection throughout life. This is not seldom already the case with the rural population. To prevent tuberculous infection is without doubt from a phthisiogenetical viewpoint the ideal and surest way to remove the foundation for consumption. To date we have not, however, reached this point but must continue to expect that the inhabitants of a city are almost daily exposed to risk of infection.

In order to determine if a tuberculous infection during childhood shall be looked upon as a favorable phenomenon, one must naturally weigh its advantages (relative immunity towards exogenous reinfections) against its disadvantages. What does this mean, and what is the immediate result of a primary infection from pathological point of view? Concerning this question I refer to my article in the American Journal of Diseases in Children, and here I will stress only a few points.

At the end of the incubation period the infected person usually becomes sick with clinical symptoms, which in many ways simulate a common acute catarrhal respiratory infection or influenza, and he recovers from this approximately as fast as if this had been the case. Convalescence is, however, frequently more protracted, and especially is this true, where the patient has been subjected to necessary control-tests such as blood sedimentation and Roentgen examinations. As a rule no progressive lung-process results, but instead an inflammation with regressive tendencies. The clinical manifestations of uncomplicated primary tuberculosis of the lungs are exceedingly common, after one has learned to identify the picture of the disease. At least this applies to the population in Scandinavia. The statement of Myers, that he has not as yet seen a single person become sick* as a result of uncomplicated primary lung infection, leads, like so many other divergent experiences, to the thought of geographic and racial differences in the course of tuberculosis, and in tuberculosis as a disease.

The first three months following manifestation of primary tuberculosis are according to our present experience particularly critical with reference to inception of meningitis or acute miliary tuberculosis. For those who have primary infection a year or more behind, the risk for these diseases is not so alarming. This applies also to acute serous tuberculous pleuritis and peritonitis, which appear with predilection during the first seven months after manifestation of the primary tuberculosis, with a maximum frequency between the third and seventh months. When the risk-periods of meningitis and pleuritis are past, tuberculosis enters a stage of latency during which progressive healing of foci takes place. It can never be determined in advance which children with primary infection will die from meningitis or miliary tuberculosis, or which ones will come down with pleuritis or peritonitis, and thus be in need of care for months. The only thing maintained is that the risk for meningitis and miliary tuberculosis is greater the younger the child and greatest during the first three years of life.

A child in which the primary infection has entered into a stage of regression-latency must for reasons indicated be considered as in a more favorable position than a child who has just been infected. The latter runs a much greater risk of meningitis, etc., than the former. To have passed through the period of risk must from this standpoint be considered advantageous.

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*Myers refers to symptoms of relatively serious nature (Ed.)

If two groups of children, the one tuberculin positive, the other tuberculin negative, are exposed to tuberculosis, as for example from consumptive teachers or schoolmates, the inhaled tubercle bacilli usually exhibit no noticeable influence on the tuberculin positive group, while in the latter group some, possibly all, are taken sick with symptoms as indicated. These children must discontinue school attendance for a longer or shorter time, and one or more of them may, in conjunction with the primary symptoms, become sick and die from tuberculous meningitis or miliary tuberculosis, and the remainder may later again be forced to discontinue school and be bedridden with prolonged pleuritis. These are not hypothetical possibilities but actual experiences. Should one ask which group *in such a situation* one should wish one's own children to belong to, I believe the answer could not be more than one; the tuberculin positive.

Tuberculin positive children are to be looked upon as a weeded out group. They have had a sufficient degree of natural resistance to pass through the primary infection without danger. They have left behind the greatest risks for meningitis, miliary infection and pleuritis. Conditions such as primary lung tuberculosis, are inherently more or less of such nature that if they can be avoided, i. e., escape the transfer of infection, then this naturally should be done. *No one would in cold blood expose a previously noninfected child to a virulent tuberculous infection merely to let the child later benefit from the specific relative immunity which the primary infection creates. The risks are too great.* For this purpose there is, on the other hand, no risk in using Calmette vaccine (Heimbeck, Scheel, Wallgren, et al.), although the immunizing effect of this can possibly never be thought to compare with that of the virulent primary infection.

Primary infection insures without doubt a certain protection to exogenous reinfections and can for this reason be regarded as favorable. A tuberculin positive child is in this respect better situated than a tuberculin negative one. Could it be guaranteed that the child would never again be exposed to the risk of infection, then primary infection would signify no advantage for the child. On the contrary, it has planted in the child a disease germ which may burst forth. To this is added the disadvantage of dangers associated with the primary infection. *Undoubtedly no physician, therefore, would assume the responsibility for not advising protection for uninfected children as long as this is possible; preferably for life.* In this endeavor to prevent tuberculous infection all specialists are agreed.

As has already been pointed out, it is practically impossible to guarantee such protection in a modern community. The individual will earlier or later be infected. The question then arises: Is it more advantageous to acquire the primary infection during childhood than at maturity? This question can be answered only on the assumption that knowledge is available as to whether or not the results of primary infection are different in one or the other age groups. It is certain that the risks of primary infection are not equal at different ages. At least during the first three years of life the primary infection is a highly feared occurrence. The same holds for the period of puberty; the intervening ages appear less risky. Whether or not it is easier for children in the nursery and earlier school ages to overcome primary lung tuberculosis or escape pleuritis more readily than adults is not known. But to judge from the experiences of Myers, Heimbeck, and Scheel, there should not be any demonstrable difference in these two age groups.

This problem needs to be examined from another and non-medical point of view. If a school child is taken sick with primary lung tuberculosis and remains away from school one to two months or more; or if it later develops pleuritis and is forced to interrupt school attendance another three or four months, then this loss of time does not mean so much to the child, especially since these diseases do not prevent studies in the home or at the hospital. Undoubtedly it means more to an adult if he is forced to discontinue work during similar periods, on account of lost wages, unfulfilled obligations, and possible loss of employment.

Experiences from Oslo and Stockholm with reference to tuberculosis morbidity in undergraduate nurses show the differences in this respect between those who have passed through their infection during childhood and those not infected. The student nurses, who upon entering the nursing school were tuberculin positive from a primary childhood infection, largely remained well and continued in training without interruption. Those again who as adults contracted primary infection during their training had to interrupt their training course for months. This corresponds to lost working days and wages under other conditions. From a social-economic point of view it ought to be better that *if* an individual *shall be infected*, this infection should occur preferably during the less risky period of childhood, i. e., during pre-primary or primary school years. If it cannot be delayed for life, it is hardly advantageous to postpone the primary infection to adult years. As long as this goal has not been attained it must be logical to consider it an advantage to have had the primary infection well done away with during childhood.

The part played by the primary infection in engendering new disease is not finished, even after several years, with the clinical healing of the foci in the primary complex. Here healing does not mean that the tubercle bacilli contained in the foci die out. But it is not sufficient to say that the individual carries living virus only in the foci of the primary complex. Many facts indicate that tubercle bacilli, at least in most instances, are localized not only in the primary complex, but that they are also spread further along blood and lymph channels.

On the basis of clinical, pathologic-anatomical, and experimental investigations (Liebermeister, et al.) there is reason to suppose that very early during the course of tuberculous infection tubercle bacilli enter the blood stream and spread to various parts of the body. Such hematogenous general spread is not necessarily manifested clinically in a noticeable manner. It can be determined with certainty that in some cases of tuberculosis, spread of virus has taken place, as for example in tuberculosis of the kidneys, bone tuberculosis and disseminated skin tuberculosis. Also in the lungs such hematogenous foci are clinically (Simon, Ulrici) or anatomically (Hübschmann) demonstrable with appreciable frequency. This hematogenous spread can be demonstrated clinically with the aid of the X-ray during the healing period as sclerosed or calcified foci (foci of Simon). But in the majority of cases, there are probably no clinical or Roentgenological symptoms manifested. Rankes' concept is well known, founded as it is on clinical investigation and anatomical studies: After the manifestation of an initial tuberculosis, a secondary phase or stage of generalization occurs.

Tubercle bacilli in the circulating blood and those disseminated in the various organs including the lungs do not bring about any clinically noticeable local reactions on the part of the tissue. The severe reaction brought on by the primary infection, and which is usually Roentgenologically demonstrable, does not occur. The tubercle bacilli disseminated into the parenchyma of the lungs, pleura and other internal organs remain where they focalize and act for the time being as innocent saprophytes, or call forth here and there a mild reaction. The question that now presents itself is: Do the tubercle bacilli disseminated in the organism constitute any danger for the future, and if so, what?

There is no doubt but that clinically healed foci in the primary complex, as well as hematogenously disseminated tubercle bacilli may constitute a starting point for new tuberculous disease. A previously healed primary focus of tuberculosis in the lung may flare up and progress. A knee joint tuberculosis may result from a hematogenously disseminated depot of bacilli in that region. Such diseases are not considered the result of exogenous reinfection. This, on the contrary, is the case when the adult type of pulmonary tuberculosis is considered. Here it is reasonable to suppose that the disease may be the result of a new inhalation of tubercle bacilli.

At this point the concept of reinfection should be defined. This expression has been used to mean various things and for this reason has aided in the creation of misconceptions. With reinfection is understood, when other infectious diseases are considered, for example syphilis, a new infection from the outside. The concept is similarly defined when experimental tuberculosis research is concerned. In cases of clinical tuberculosis in man, some authors speak of reinfection also when the virus from a focus already present in the organism is spread to another part of it. From this idea has been derived the expression "reinfection type of tuberculosis," which according to my opinion is misleading, when applied to all tuberculosis not the immediate result of primary infection.

An infected individual, in whom the virus has not died out, can hardly be thought to be infected anew by the same virus which brought about the primary infection. Reinfection is not spoken of when a septic pyemia develops from a suppurative lymph adenitis or when an orchitis develops as a sequel to epidemic parotitis. According to my idea it is fundamentally incorrect to speak of reinfection, when only a dissemination of tubercle bacilli already present in the organism is meant. If we abandon the expression endogenous reinfection and speak of reinfection exclusively when a real exogenous reinfection is meant, this would without doubt assist in bringing together now apparently divergent conceptions. With "reinfection type of tuberculosis" should be understood exclusively such tuberculous disease as arises from an exogenous reinfection. It has not yet been shown that the classical type of lung tuberculosis results from such exogenous reinfections of the lung. On the contrary, experience up to the present speaks for the fact that under ordinary circumstances exogenous reinfection does not decide whether or not lung tuberculosis shall develop. There is a possibility that in certain special cases phthisis *may* develop following certain new infection of the lung. When as common a disease as tuberculosis of the lung is under consideration one ought, however, to put the emphasis on the common pathogenesis and not on the special cases. It may be stated as absolutely certain that an exogenous reinfection is unnecessary in order that lung tuberculosis shall develop.

If it is not a new infection from the outside that usually originates lung tuberculosis, then it must be brought about by the same order of bacilli that were introduced at the time of the primary infection. This is probably the most common idea even among those who assume that a new invasion of tubercle bacilli into the lung parenchyma is essential, in order that tuberculous disease of the character of consumption shall develop. These authorities seemingly predicate that this endogenous spread of tubercle bacilli occurs just before the inception of the lung tuberculosis in the part in question. It is possible that this takes place, but at present we know nothing about it. It is clearly hypothetical. These tubercle bacilli may have landed in the part where the lung tuberculosis develops far earlier, possibly already during the active period of primary tuberculosis.

There is no doubt that in some cases lung tuberculosis may originate in the foci which constituted the primary complex. These are, however, probable exceptions. Very often in the case of adults, lung tuberculosis starts in another portion of the lung than the one immediately affected by the primary tuberculosis. As just stated, the tubercle bacilli have come to this portion of the lung through hematogenous spread. The virus may have remained latent during a very long time and not been able to begin its deleterious work until other provisions necessary for the development of lung tuberculosis have been filled.

Tuberculosis of the lungs according to this concept is usually not the immediate result of introduction of tubercle bacilli either from the outside or the inside into the allergic portion of the lung, but is rather the effect of activity by tubercle bacilli, which in most cases of lung tuberculosis have long remained in the same place, but have not been able to start a progressive process on account of resistance on the part of the organism and especially the lungs. This resistance in the case of average people is sufficiently great to keep down the virulence of the bacilli for life, but in certain individuals the local or general resistance under special circumstances will waver and with this the field is open for the pathogenic activity of the germs. According to this concept tuberculosis of the lungs is thus a result of a flare up of latent tuberculous foci. These foci or depots of bacilli are present in all infected people, but develop into lung tuberculosis only in some. Bone tuberculosis is analogously an effect from a flare up of tubercle bacilli latently present in the bone.

The next and very important question becomes: What is the reason that the tubercle bacilli gain the upper hand and produce lung tuberculosis? There is seldom reason to assume that the disease started because of particularly great virulence on the part of the infecting tubercle bacilli in the case under consideration. Cases of this type undoubtedly are exceptional and the bacillary virulence is about equal as a rule when human bacilli bring about tuberculous disease in man. Neither is it probable that the infecting dose varies essentially in different cases (Bruno Lange). Under such conditions it must be that variations in resistance in the infected organism and especially in the infected tissue make it possible that some individuals contract lung tuberculosis and others do not.

Upon what then does it depend that some individuals develop a decreased resistance of pulmonary tissue? This question cannot be answered with a simple formula. The conditions are considerably complicated and without question there can be varying causes in different cases. Much of this is as yet hidden from us and still we know a little. Particularly during the last years our experience has widened, and we have obtained a more solid platform from which to evaluate this problem.

Age is an extremely important factor. Lung tuberculosis is not a childhood disease. It hardly appears much before puberty and just during the years of puberty it is, as is known, not at all uncommon. The circumstances that tuberculosis of the lungs is not exhibited in children before the age of ten should be thought-impelling for those authors who believe that the disease develops when an allergic organism is reinfected. Chances are that children who have been infected at an early age and thus have become allergic meet with reinfection as often as individuals in and above the age of puberty. In the case of tuberculin positive children the inhalation of tubercle bacilli, or the spread of these to the lung, never leads to lung tuberculosis, while lung tuberculosis is common in a later age category of people. This shows that *if allergic change of the organism plays a part in the bringing about of lung tuberculosis, then there are additional factors which in a similarly high degree ar influential.* Such a factor is that the age of puberty shall have been reached. The influence of puberty cannot well be thought to be exercised in any other way than through the mechanism of the internal secretions. That this plays a part in the case of a non-specific resistance to tuberculosis is shown by the increase in frequency of lung tuberculosis in connection with gravidity and puerperium.

Another non-specific factor which lowers resistance to tuberculosis is what we pediatricians call "hospitalismus," which, when adults are considered, can be expressed as influences from an unnatural, unhygienic mode of life, strength reducing infections and other diseases. Here is surely to be sought the reasons for the ravages of tuberculosis in prison camps, insane asylums, etc. These facts are so well known and undenied that I can pass them by.

The most significant factor in order that lung tuberculosis should develop from a primary infection is probably hereditary disposition. This has been fully proven by Diehl's and von Verschuer's study on tuberculosis in twins which excited much attention. According to my view, this is perhaps the most important work with reference to tuberculosis that has been brought out during the last decade. Through careful histories and clinical examinations of a great number of twins of which at least one twin had tuberculosis, these authors have furnished sure proofs of the very great role hereditary disposition plays in the course of tuberculosis, particularly on the origin of lung tuberculosis.

No hypothesis on the origin of "consumption" can be seriously discussed if respect is not paid to the dominating importance of hereditary disposition, but even if hereditary disposition is fully considered, this is still not the only factor which decides the fate of an infected person relative to "consumption." The previously mentioned more or less incidental dispositional or environmental social factors also play a very important role. They may cause lung tuberculosis to develop even in those without hereditary disposition. Finally and chiefly, however, it is hereditary disposition which under ordinary circumstances has the deciding vote with reference to the result of an infection acquired during childhood.

The first prerequisite that a lung tuberculosis shall develop is a tuberculous infection and this regardless of whether the infection occurs during childhood or later. "Consumption" can only occur in those infected with tubercle bacilli. The risk for lung tuberculosis following infection should not, however, be over-estimated. Only a very small fraction of all infected develop lung tuberculosis. In general, at least in our country, in the cities where practically all adults earlier or later become infected, we count upon a frequency of consumption of from one to two per cent. When Myers states that at least 20 per cent of all tuberculin positive children will suffer or die from "clinical tuberculosis," if he means with clinical lung tuberculosis, then this is something which does not correspond to European experience.[**] This divergence must depend either on geographical differences or that Myers has studied a material in which the consumptive disposition, as conditioned by hereditary or other factors, is greater than that of the population in general.

The second prerequisite that lung tuberculosis shall develop is a disposition, and among all the constitutional and conditional factors, which together constitute the concept of disposition to consumption, the most significant are heredity and that the age of puberty shall have been reached.

In order that lung tuberculosis shall develop, both these prerequisites are equally inescapable. *Without infection no tuberculosis and without disposition no consumption.*

If a child acquires a primary infection and successfully weathers the critical period, then this child in its continued existence is fairly well protected from the dangers which exposure to tuberculosis infection may imply even under unfavorable conditions. The primary infection has given the child a valuable specific contribution to its hereditary non-specific resistance to infections from the outside. Then ensues a tranquil period the length of which varies with the individual, and which in the majority lasts throughout life. In a small fraction, particularly through heredity but also through environmental conditions and other unfavorable circumstances, there is a disposition to lung tuberculosis, and of these infected individuals the majority of infected develop consumption.

[**] Myers refers to all post-primary forms of tuberculosis combined; and the 20 per cent is the estimated total morbidity expected in infected children during the course of two or more decades. (Morbidity at end of 13 years has reached 10 per cent.) (Ed.)

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Abdominal Surgery in Children*

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THIS IS a study of acute abdominal surgery in the pediatric age group, from birth to 16 years of age. The data were obtained from cases admitted to Trinity Hospital, under the supervision of the Northwest Clinic, extending from January 1st, 1930, to January 1st, 1936. For the most part the cases are of appendicitis, the other conditions will merely be enumerated later.

In this series there were 240 cases operated upon for appendicitis immediately upon admission, there being no cases that were treated by the conservative method.

For comparative analysis the cases of appendicitis were divided into four groups, namely, (1) interval or subacute, (2) acute non-perforated, (3) perforated, with localized peritonitis or abscess formation, (4) perforated with generalized peritonitis. Another group of 41* cases which gave a clinical history of appendicitis was operated upon, but was not analyzed. The surgeon and pathologist agreed that the appendix was normal in 25 cases. However, in 16 instances the surgeon stated in his operative notes that the appendices were chronically or subacutely inflamed, but the pathologists reported normal appendices.

Of the 199 cases studied, females predominated slightly, 111 cases or 55 per cent females and 88 cases or 45 per cent males. The average age for the whole group was 10.4 years, the youngest patient being 18 months, the oldest 15 years.

When these cases were analyzed the following points were taken into consideration: duration of symptoms before admission to the hospital, symptoms and findings; admission temperature and leukocyte count; the number of cases having previous attacks, or fecaliths in the appendix. The length of hospitalization and post-operative complications were compared in the four groups (Table I).

TABLE I
ANALYSIS OF 199 CASES OF APPENDICITIS IN CHILDREN

	Interval or Subacute Appendicitis	Acute Non-Perforated Appendicitis	Perforated with Local Peritonitis or Abscess	Perforated with Generalized Peritonitis
Average Duration of Symptoms (Hours) ...	65	57	95.9	64.2
Symptoms—				
Pain	100%	100%	100%	100%
Nausea	62%	80%	80%	78%
Vomiting	38%	68%	91%	84%
Anorexia	38%	70%	69%	54%
Diarrhea	3%	28%	54%	40.5%
Catharsis	3%	18%	40%	40.5%
Findings—				
Tenderness	97%	98%	100%	100%
Rigidity	38%	69%	97%	100%
Rebound Tenderness ..	16%	27%	51%	70%
Average Temperature on Admission	99.4	100	100.9	100.9
Average W. B. C. on Admission	9,631	16,076	22,844	19,390
Previous Attacks	89%	58%	20%	30%
Fecaliths	26%	29%	61%	41%
Complications	0	12%	28%	24%
Average Hospital Stay (Days)	10.7	11.66	25.4	23.7

The long duration of symptoms in the acute non-perforated group may be explained by several factors. Some of these patients came from quite long distances. Another reason is that 29 per cent of these cases had fecaliths, some of which gave symptoms as long as ten days before admission, consequently lengthening the average duration of symptoms. Five cases or 5.5 per cent were found to have pin worms within the lumen of the appendix with resultant mechanical obstruction and appendiceal colic. In only one of these five cases was the appendix acutely inflamed.

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It is important to note the relatively high incidence of diarrhea and catharsis in the two groups that were ruptured. Also, the cases that were ruptured had the highest incidence of fecaliths, 61 per cent in the group which were ruptured and abscesses had formed, while 41 per cent were found in the cases that were ruptured and had generalized peritonitis. The group of ruptured appendices with either localized peritonitis or localized abscess was divided as follows: 5 cases with localized peritonitis and 30 with abscess formation. In four of the latter group, the appendix was not removed, only drainage being established, three by the abdominal and one by the rectal route.

The mortality rate in this series of 240 cases was 3.33 per cent or 8 deaths. (See Table No. II).

One patient with a ruptured appendix and local abscess died 110 days post-operatively following many complications. The other seven cases were in the group with generalized peritonitis. Two of the seven cases died very shortly after operation; one in four hours—the other in seven hours. Although these patients were in a moribund state, immediate operative interference was carried out in order to establish drainage and to remove the appendix if practical.

The post-operative care consists of fluids given parenterally, either subcutaneously or intravenously, for 2 or 3 days. Enemas are used if there is an indication of distention of the abdomen. In the last few years nasal suction is instituted if the patient's distention can not be relieved by enema, or if the patient vomits or shows signs of intestinal obstruction post-operatively.

The eight fatalities will be taken up individually in more detail.

CASE I. H. W., age 12, white male. Patient admitted on 8-2-34. Expired 11-20-34.

P.C.: Diarrhea, pain and tenderness in right lower quadrant, vomiting, anorexia and fever.

TABLE II
MORTALITY

Type	No. Cases	Deaths	Mortality
Interval	37	0	0.00
Acute Non-Perforated	90	0	0.00
Perforated with Local Peritonitis and Abscess	35	1	2.85%
Perforated with General Peritonitis	37	7	19.00%
Clinically Appendicitis*	41	0	0.00
Total	240	8	3.33%

P. I.: 72 hour history of pain in the right lower quadrant, which was preceded by diarrhea. Vomiting occurred the first two days of symptoms. During the pre-operative course the patient was given Ex-Lax and castor oil. There were no previous attacks of appendicitis.

P. E.: Negative except for abdominal findings of rigidity and marked tenderness in right lower quadrant. There was a palpable mass near the right inguinal ligament.

Temperature on admission 99. W.B.C. 24,075.

Diagnosis: Ruptured appendix with localized abscess.

OPERATIVE NOTE: Appendiceal abscess.

What was done: McBurney's incision. Appendectomy—3 Penrose drains and a Mikulicz-Gibson pack. The anesthetic used was nitrous oxide. Length of procedure was 13 minutes.

PROGRESS: On 8-16-34 secondary abscesses in abdomen drained.

10-3-34. Bronchopneumonia right lung—pleurisy left.

10-12-34. Subphrenic abscess drained.

During post-operative course received seven blood transfusions.

11-18-34. Patient very drowsy and listless. Had difficulty making complete sentences.

11-19-34. Neck rigid, and patient very drowsy.

11-20-34. Expired 110 days post-operatively.

Suspected metastatic brain abscess.

No autopsy permitted.

CASE II. M. D., white female, age 11. Admitted 5-9-31. Expired 5-9-31.

E. C.: Pain in abdomen, vomiting, fever, constipation.

P. I.: 144 hour history of generalized abdominal pain, beginning during the night of 5-3-31. Generalized abdominal tenderness since 5-4-31. On 5-5-31 began vomiting. Has had occasional chill. There had been no previous attacks of appendicitis, and no catharsis.

P. E.: Poorly nourished, moribund, white female of 11 years. Examination negative except for abdominal findings of generalized rigidity, tenderness and rebound tenderness, with marked distention of the abdomen.

Temperature 101.2 W.B.C. 16,000. Pulse 150. Respiration 16.

Diagnosis: Ruptured appendix with generalized peritonitis.

OPERATIVE NOTE: Large amount of foul smelling pus—not walled off. Appendix not visualized.

What was done: Jejunostomy thru incision in left upper rectus. Right rectus incision for drainage tube and Mikulicz-Gibson pack. The anesthetic used was nitrous oxide. Length of operation was 26 minutes.

Post-Operative: Patient's condition very grave. Given subcutaneous and intravenous fluids. Morphine sulphate used for sedation. Patient expired 7 hours post-operatively.

No autopsy permitted.

CASE III. A. H., white male. age 15. Admitted 10-24-34. Expired 11-8-34.

E. C.: Pain in abdomen, vomiting and diarrhea.

P. I.: 72 hour history of abdominal pain, nausea, vomiting and diarrhea. No previous attacks of appendicitis and no catharsis.

P. E.: Negative except for abdominal findings of marked generalized tenderness, rigidity and rebound tenderness.

Pulse 150. Temperature 101.2. W.B.C. 24,400.

Diagnosis: Ruptured appendix with generalized peritonitis.

OPERATIVE NOTE: Large amount of foul pus in abdomen—colon odor. Appendix extended into true pelvis—was gangrenous throughout and ruptured.

What was done: McBurney's incision. Appendectomy—3 Penrose drains and Mikulicz-Gibson pack. The anesthetic used was nitrous oxide. Length of operation fifteen minutes.

PROGRESS: Patient developed an ileus post-operatively and was treated by nasal suction and enemas.

11-5-34. Patient more listless—abdomen distended.

11-7-34. Condition more critical—gradually becoming weaker.

11-8-34. Expired 15th post-operative day.

No autopsy permitted.

CASE IV. G. R., while male, age 3 years. Admitted 8-4-34. Expired 8-11-34.

E. C.: Anorexia, pain in abdomen, diarrhea.

P. I.: 30 hour history of pain in the abdomen, anorexia and diarrhea. There were no previous attacks of appendicitis, and no catharsis given.

P. E.: Well nourished, pale male 3 years old. Examination negative except for abdominal findings of rigidity and tenderness in right lower quadrant. Same findings but to a lesser degree in left lower quadrant.

Pulse 140. Temperature 102. W.B.C. 22,850.

Diagnosis: Ruptured appendix with generalized peritonitis.

OPERATIVE NOTE: Free pus in the peritoneal cavity. The appendix was perforated and contained a fecalith.

What was done: McBurney's incision. Appendectomy. 3 Penrose drains and Mikulicz-Gibson pack. Anesthetic used was ether. Length of operation 20 minutes.

PROGRESS: After second post-operative day patient was very distended. Nasal suction was instituted—also enema. Patient's temperature was very septic, reading 104° or higher each day. Expired 8-11-34, seventh post-operative day.

AUTOPSY: Findings: Recent volvulus in terminal ileum with obstruction of the lumen.

CASE V. G.B., white male, 12 years old. Admitted 1-2-30. Expired 1-2-30.

E. C.: Abdominal pain and vomiting.

P. I.: 96 hour history of pain in abdomen, associated with vomiting and diarrhea. There had been no previous attacks of appendicitis, and no catharsis given.

P. E.: Patient appeared quite ill—cheeks flushed—dehydrated. Examination negative except for marked dehydration and abdominal findings of moderate distention, which was symmetrical; there was marked tenderness throughout; moderate rigidity; and no masses.

Temperature 101.8. Pulse 145. W.B.C. 9,000.

Diagnosis: Acute perforated appendicitis, with peritonitis.

OPERATIVE NOTE: Peritoneal cavity contained large amount of seropurulent fluid.

What was done: Right rectus incision and drain inserted. No attempt was made to find the appendix. The procedure was carried out under local anesthesia, with nitrous oxide supplemented for four minutes. Length of procedure 13 minutes.

PROGRESS: Patient's condition grew steadily worse. Temperature rose to 106°. Expired four hours post-operatively.

Patient was in very poor condition for operation, but it was felt drainage was imperative.

No autopsy permitted.

CASE VI. N. S., white male, age 7 years. Admitted 3-18-30. Expired 3-30-30.

E. C.: Pain in abdomen and vomiting.

P. I.: 24 hour history of pain in abdomen, also nausea and vomiting. Patient given cascara. There had been no previous attacks of appendicitis.

P. E.: Well developed male with anxious *facies* and in distress. Abodmen slightly distended. There was marked tenderness and rigidity throughout the abdomen, most marked on the right side; there were no masses.

Temperature 101.4. Pulse 115. W.B.C. 17,200.

Diagnosis: Ruptured appendix, with generalized peritonitis.

OPERATIVE NOTE: 3-18-30. Upon opening the peritoneal cavity a large amount of pus escaped—no attempt was made to wall off. Appendix was ruptured and acutely inflamed.

What was done: McBurney incision. Appendectomy. Mikulicz-Gibson pack and 2 Penrose drains. Anesthetic used was nitrous oxide. Length of procedure was 7 minutes.

PROGRESS: Temperature and pulse gradually subsided to normal on the tenth post-operative day. However, on the eleventh post-operative day the temperature rose to 101.2.

3-30-30. A large abscess was incised and drained. Nitrous oxide anesthesia used. Length of operation was 10 minutes. Patient's condition very poor post-operatively. He expired one hour after drainage of abscess, or twelve days after appendectomy.

No autopsy permitted.

CASE VII. W. Z., white male, 11 years. Admitted 10-6-30. Expired 10-8-30.

E. C.: Generalized abdominal pain.

P. I.: 48 hour history of pain in abdomen, nausea, and vomiting. There had been no previous attacks of appendicitis, and no catharsis given.

P. E.: Examination negative except for abdominal findings of slight distention, tenderness and rigidity in all quadrants. No mass was palpable.

Temperature 100.6. Pulse 140. W.B.C. 13,100.

Diagnosis: Ruptured appendix with generalized peritonitis.

OPERATIVE NOTE: Large amount of thick foul pus in abdomen; no walling off. The appendix was gangrenous.

What was done: Right rectus incision. Appendectomy. Stump not inverted. Two drains inserted. Anesthetic used was nitrous oxide. Length of operation was 24 minutes.

PROGRESS: Patient's condition much more critical 24 hours after operation—very toxic, irrational and temperature rose to 108. Expired second post-operative day.

No autopsy permitted.

CASE VIII. R. D., white female, age 14 years. Admitted 9-3-31. Expired 9-12-31.

E. C.: Pain in abdomen, nausea, vomiting, fever.

P. I.: 144 hour history of pain in the abdomen, nausea and vomiting. Patient took salts. She had had four previous attacks of appendicitis.

Temperature 101. Pulse 110. W.B.C. 17,600.

Diagnosis: Ruptured appendix, with generalized peritonitis.

OPERATIVE NOTE: Large amount of free pus in the abdominal cavity. The appendix was acutely inflamed throughout, gangrenous and ruptured.

What was done: McBurney's incision. Appendectomy—3 Penrose drains and a Mikulicz-Gibson pack.

PROGRESS: Patient had a very septic temperature post-operatively. Expired eighth post-operative day.

No autopsy permitted.

Other surgical conditions of the abdomen which occurred in the pediatric age group during the past six years are of a mixed type. Because so few of the same type of conditions were present, these cases were not analyzed completely. (See Table III.)

The four cases of pyloric stenosis were all males, ranging in age from two weeks to two months. They were all treated by the Rammstedt operation.

In the cases of intestinal obstruction all were small bowel obstructions, due to adhesions. Three of the four cases had an antecedent history of a ruptured appendix. The other case, although there was no history of appendicitis, had an adhesion extending from the mesenteric border of one loop, and attached to another loop of bowel. The etiology of this adhesive band may have been due to the so-called fetal peritonitis, or congenital adhesions. The only female in this group was found to have another condition, in addition to an intestinal obstruction, when the laparotomy was performed. This consisted of a right hydrosalpinx with a twisted pedicle, which necessitated a salpingectomy.

There were three cases of strangulated hernia. In none was it necessary to resect any bowel. During this period 17 cases were operated upon for simple non-strangulated hernias, but were not included in Table III. Two patients had

TABLE III

MISCELLANEOUS GROUP OF SURGICAL CONDITIONS OF THE ABDOMEN IN CHILDREN

Case	No.	Deaths
Pyloric Stenosis	4	..
Intestinal Obstruction	4	..
Hernia, Strangulated	3	..
Foreign Bodies in Stomach	2	..
Intussusception	2	1
Stenosis of Esophagus	1	..
Laceration of Liver	1	..
Gun Shot Wound with Perforation of Colon	1	..
Sarcoma of Right Kidney	1	..
Primary Peritonitis	1	1

foreign bodies in their stomachs, for which a gastrotomy was done. One of the foreign bodies was a needle and the other an open safety pin.

The case of stenosis of the esophagus occurred in a female four years old, following the drinking of a lye solution; a gastrotomy was the operative procedure, to facilitate feeding.

There was one case of sarcoma of the right kidney in a male one year of age. A nephrectomy was done, followed by deep X-ray treatments to the abdomen.

Two cases of intussusception were operated upon. One was easily reduced and made an uneventful recovery. The other case, a white female, age 15 years, had symptoms of intussusception for 22 hours before operation. When explored it was found that the intussusception involved 35 cm. of small bowel, which when reduced was found to be gangrenous. The gangrenous bowel was resected, and when examined revealed two papillomas, which no doubt caused the intussusception. The patient had a very stormy post-operative course, and died the fifth post-operative day with a complicating peritonitis.

Primary peritonitis was present only once in this group of cases. The patient was a white male, four years old. His symptoms of pain in the abdomen, nausea, vomiting and fever were of seven days duration. The physical findings of note were in the abdomen, which presented distention, generalized rigidity, tenderness and rebound tenderness. Admission temperature was 104.2, pulse 160 and W.B.C. 34,400. Pre-operatively the diagnosis was ruptured appendix with generalized peritonitis. When the peritoneal cavity was opened there was a considerable amount of odorless fluid. The appendix was acutely inflamed but not gangrenous or perforated. An appendectomy was performed, and drains inserted. The pathological report was as follows—grossly, the serosa was read and rough; the lining was grey and edematous, but smooth. Histologically on the serosa of the appendix was a thick exudate of fibrin and polynuclear leukocytes. These changes extended into the muscularis, but did not involve the submucosa or the lining of the appendix.

The patient was given a blood transfusion and parenteral fluids post-operative. His condition became progressively worse, expiring sixteen hours post-operatively.

Conclusion

All of the cases of appendicitis were treated by surgical intervention immediately upon admission to the hospital. The mortality rate of 3.33 per cent in a group of 240 children operated upon for appendicitis compares very favorably with other statistical studies, in which the patients were treated either by the radical surgical method, or the conservative method.

Endocrine Factors in Behavior*

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MEDICINE is now in process of emerging from a century old abrogation of its chief function, the healing of the whole man. So impressive was the work of Virchow and his successors in pathology and so revelatory was the work of the bacteriologists and the physiologists in the succeeding decades that the physician became over-desirous of emulating the achievements of the specialized scientists in their various realms. The growing knowledge of disease, as disease, became so fascinating that attention was often lost of the man who had the disease. At the culmination of the period, the leading medical schools of this country had come to place such a heavy emphasis upon pathology and diagnosis that practical matters of therapeutics were largely neglected. Too, as a part of the scientific trend, undue emphasis was often laid upon laboratory procedures.

Each of these developments represented merely an unwholesome over-emphasis of matters that were intrinsically important. But they tended to obscure the highly significant personal relationship between patient and physician. As this relationship became increasingly attenuated other agents stepped in to fill the gap. For the past two decades we have seen mothers avidly flocking to child psychologists—often themselves celibate and badly integrated — seeking words of wisdom regarding the upbringing of children. These counsellors, blissfully ignorant of folk wisdom and its recent validation by the work of Cowgill, have given an unconscionable amount of fundamentally bad advice. As a result juvenile barbarity has often been allowed to lead uncurbed to post-adolescent libertinism. Pseudo-psychologists have been filling lecture halls for years. Immature books on "personality" have followed each other with astonishing frequency. The subject need not be labored. The only point I wish to make is that counsel upon intimate and personal matters is needed by a great many people and that the wise physician is, on the whole, the most competent to meet this need.

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As Cannon[1] has recently emphasized, with large measure of success in the conquering of the infectious diseases, on the one hand and with the growing intensity of social strains, on the other, the very nature of medical practice is undergoing a fundamental transformation. More and more patients are seeking medical aid for disorders that are due to psychological factors rather than to tissue injuries. It has often been argued and with plausibility, that the rise and persistence of medical cults is due largely to ineptitude on the part of the physician in dealing with the psychological and social factors in the disorders of his patients. A growing recognition of the importance of personality factors is mirrored in the increasing number of articles that are being published on matters of psychopathology in journals devoted to general medicine. The basis of success in psychological medicine is a knowledge of personality.

Many elements enter into the make-up of the personality. Some of these are congenital and some acquired. The human infant brings into the world with him an elaborate equipment for living. In many respects this equipment is fixed, but in many others considerable leeway exists for the modification of the constitutional characteristics. It is upon this modifiability that education in the broad sense is based. It will be the purpose of this paper to discuss the influence of endocrine factors on the constitutional trends and the subsequent development of the individual and especially as this is manifested in his behavior. The behavior in turn is stressed primarily as an index of the personality.

A commonly over-emphasized factor in the personality is the intellect, i.e., the operation of the higher mental processes. These are actually a recent acquisition in the course of human evolution. From the general biological point of view the intelligence is mostly a device to secure for the individual the most gratifying indulgence of his instincts. Its actual every day use is largely to rationalize the things that we do because we instinctively want to do them. This principle serves to explain why appeals to reason are so much less effective than the naive counsellor, whether physician, teacher or parent, expects. Whatever may be their importance, the intellectual processes are to a considerable extent dependent upon hormone factors.

More important in the determination of the personality are the instincts and the emotions. The instincts may be roughly defined as the behavior trends that are determined by the constitutional make-up. The emotions represent the way the instincts-in-operation feel to the individual who has them. It is the instinctual drives that the psychoanalyst has in mind in his use of the term, "id forces." These instinctual trends are determined in large measure by the hormones.

Evidence for the operation of the endocrine factors in personality is obtained partly from animal experimentation and partly from observations upon patients who show endocrine abnormalities or who are under glandular treatment. It goes without saying that observations upon animals are valid in this connection only as they serve to demonstrate principles. Actual details of the operation of these principles must be obtained from studies upon man himself.

The operation of endocrine factors in behavior is seen most clearly in the sex sphere. For many centuries it has been a matter of folk knowledge that castration results in marked changes in the disposition. The contrast between the fiery, aggressive stallion and his placid brother, the work-horse, or between the spirited bull and the gentle ox is determined by internal secretions from the testes. By appropriate castration and gland-grafting methods sexual neutrality, masculinity or femininity can be set up in various species at will. By the use of a sex-hormone preparation Bard was able to restore the amorous propensities of an unsexed cat and keep "her" in an erotic state for weeks at a time. The common fowl serves admirably for experiments on sex gland biology. When the primary gonads are removed from either a young male or a young female, the result is an overgrown creature, the capon or the poulard. The erstwhile male remains timid and never indulges the well-known strivings and struttings of masculinity. And the case of the poulard is no better. Femininity is not for "her":

"she" is without charm and without carnal desire. What is especially significant is that when rudiments of gonad tissue are left behind in the operation on the females either ovary or testis may regenerate. The *quantity* of sex drive that finally results depends upon the amount of functional gonadal tissue; the *quality* of the drive depends upon the kind of regeneration that takes place. Thus all gradations can be set up between complete femininity and complete masculinity. Furthermore, as Domm[2] has shown, sexual behavior can be made to appear prematurely. By the use of a pituitary hormone he has caused baby cockerels to crow at 9 days and to attempt to mate at 13 days of age.

In the human species the operation of the sex-hormone factors is not so sharply defined though the principles are obviously the same. The human eunuch is reported as lacking in initiative and stamina, as "lone wolf," quiet, retiring, shut-in, and work-shy. The picture, however, varies a good deal in its ultimate development and some individuals completely or largely devoid of primary sex hormones seem to be not greatly handicapped by the deprivation. The mentality as such is apparently little affected and indeed the mental attainments may be improved by freedom from the diversions and distractions incident to the possession of gonadal hormones. It is in the personality as distinct from body or mind, as such, in which the defect is chiefly apparent. The boy deprived of his primary sex glands remains throughout life emotionally immature. Into his ear the soft voice of love does not enter. Romance with all the rich connotations of that term is not for him.

In the female sex the effects of early gonadectomy are largely unknown, but fairly high degrees of ovarian deficiency not infrequently come about from failure of the pituitary to supply adequate amounts of gonadotropic hormone. In such cases there is a lag in, or failure of, unfolding of the secondary sex characteristics. The uterus and mammary glands remain small and the psychological differentiation normal to puberty fails to take place. No more than a Platonic interest in the opposite sex is shown. Courtship offers no charm and there is neither ability nor inclination successfully to mate.

The loss of the ovaries after puberty results in a train of symptoms that are unfortunately well known. Irritability, hot flashes, headaches, and dissatisfaction with life are prominently evident. After a time a new hormone balance is achieved and a tendency to detachment and calmness of demeanor supervenes.

Most unfortunate is the condition that arises when the ovaries become hypofunctional but are still able to produce hormones in deficient and varying amounts. It is under these conditions of persistent imbalance that we see the most trying symptomatology. The patients are insistently egoistic, carping, hyperemotional and addicted to self-pity—the "sour, old-maid type."

Only a beginning has yet been made in therapeutic studies of the personality aspects of hypogonadism but a variety of interesting problems now lend themselves to practical investigation by the use of the sex hormones. Psychologists have as yet been little interested in such problems and few gynecologists are well versed in technical psychology. The problems are complex and other than hormone factors play large roles. Many women report no conscious influence on the sex drives following the use of hormone preparations but in a few cases uncomfortable erotization has been reported. It is probably significant in this connection that sex impulses tend to be rather more generalized in women than in men, and it is not improbable that searching investigation would bring out subtle changes of which the subjects are not consciously aware. The most striking changes in the personality following the use of sex hormone have been reported by Werner and his colleagues.[3] He conducted a well controlled therapeutic experiment on a rather large group of victims of involutional melancholia. The improvement was notable and the authors felt confident that the hormone had significantly attacked the cause of the psychosis. Psychiatrists in various institutions are now giving their attention to this problem and the potentialities as well as the limitations of the therapy should soon be much better known.

Whatever questions there may be regarding the significance of abnormal sex-hormone conditions, there can be no doubt that a multitude of questions arise from possession of normal sex gland equipment. With the onset of puberty nature and society come into conflict. Each year that marriage must be postponed beyond the age of early maturity adds to the problems that arise and the compromises that must be made. Directly or indirectly many of these problems are referred to the physician. It is unfortunate that he is often almost as naively incompetent as the seeker himself to deal with them. The records of the mental hospitals are full of data showing the tragic results of failure of sympathetic and adequate counsel at the right time. A substantial part of the responsibility for the social wreckage growing out of ignorance of sex psychology rests with the general practitioners of medicine. In this regard he is his brother's keeper and has a primary responsibility that can be met only by fitting himself to deal understandingly and intelligently with personality problems. By the time the given problem comes to the attention of the psychiatrist it is often too late.

One interesting aspect of sexual psychophysiology has but recently come to light in the discovery of a hormone from the pituitary gland which controls the secretion of milk. This, Riddle has named "Prolactin." But the influence of the hormone is more permeative than its name implies. It involves also the instinctual drives. When prolactin is administered to young adult virgin rats, a remarkable change in their behavior takes place. Whereas previous to the injection they were quite uninterested in baby rats that might be offered to them for adoption they now eagerly adopt as many infants as may be offered, build elaborate nests for them and eagerly mother them. Their maternal yearning extends to baby mice, rabbits, or even helpless squabs, which are now mothered rather than eaten, as is the normal procedure under such circumstances. What part prolactin may play in the determination of human instincts and emotions is as yet quite unknown, but several interesting questions arise. To what extent is mother love a matter of hormone chemistry? Could prolactin convert a cold misanthrope into a lover of his kind? One wonders whether the folk phrase, "the milk of human kindness," indicates a vague sensing of the action of prolactin.

In any case these new observations serve to sharpen a matter that is of a good deal of theoretical importance. On one day the subject of a prolactin experiment presents an energy system that reacts in a characteristic set of behavior patterns. A week later, the same rat shows behavior patterns that are markedly different. The reacting organs are the same, the contained energy of the system is the same. Whence comes the difference? We seem to be brought to the recognition of a far-reaching biological principle, that of *chemical conditioning*. The results are comparable to, and in the last analysis possibly identical with, the more familiar types of conditioning by experience that Pavlov and others have studied. That we "learn" by experience has long been known. It is now apparent that we may also "learn" by the injection of a hormone. I think that there is more involved here than the application of a new term to well known phenomenology. The principle should lead to a clearer understanding of the fundamental psychological aspects of endocrinology, and perhaps to the mechanism of conditioning in general.

As is well known, the thyroid gland also plays a considerable part in the determination of personality. The effects of the higher grades of thyroid deficiency are matters of textbook knowledge. Perhaps more important, however, are the effects of lesser degrees. Several writers, including McLester,[4] Mayo[5] and Lisser,[6] have recently commented upon this as a fairly common but often unrecognized clinical condition. The subject, whether child or adult, usually shows disturbances in nutrition. According to the textbooks, he is fat; as a matter of practical fact he is often thin. Manifestations are numerous and only a few will be mentioned. The clinical picture is rather vague and has been characterized as "general poor health."[4] The endurance is fitfully low, though under special stimulation the subject may rise episodically to a fairly high state of efficiency. He is hauntingly conscious of chronically "failing to do himself justice." Perhaps to the subject himself the most disagreeable feature is the diagnosis of "neurasthenia" which is commonly inflicted upon him because of the accompanying characteristic vague pains, dissatisfaction with life, irritability and depression. He is repeatedly assured that it is "just nerves" and all he needs to do is to "forget it." The condition is relatively easy to diagnose if one happens to think to look for it. In children the most important diagnostic indicator is retardation of skeletal maturation and in adults is a depression of the basal metabolic rate. It is to be noted, however, that basality in patients of this type is somewhat difficult to secure and that the laboratory reports are often misleadingly high. The disorder commonly yields readily to thyroid medication. Indeed, one suspects that no little of the popularity of hit-or-miss endocrine therapy is due to the widespread occurrence of minor thyroid deficiency and the shrewd habit of manufacturers of adding a bit of thyroid to the ingredients of otherwise useless formulas.

Important as are the sex glands and the thyroid, it is becoming increasingly evident that the chief regulatory gland is the pituitary. Its versatility as conductor of the endocrine orchestra becomes more astonishing the more we learn about it. In addition to its direct effects upon the various bodily processes it is important that the integrity of the thyroid, the adrenals and the gonads is maintained by pituitary hormones, hence all the influences mediated directly by these three are dependent secondarily upon the pituitary. In its control of growth, the pituitary determines whether the individual is to be of normal size, a giant, a dwarf, or an acromegalic. A disturbance of the pituitary-hypothalamic relationship may result in marked obesity. Claims have been made that these disturbances are associated with changes in the instinctual life but the evidence is none too convincing. It is important, however, that physical abnormalities give rise to the employment of various psychological compensatory mechanisms and thus at least secondarily do influence the personality. Several investigators of recent years have ascribed to the pituitary an immediate influence upon personality. The belief is growing that problem children when carefully studied from a metabolic point of view can be shown in substantial numbers to be suffering from pituitary deficiency. There are claims in the literature that considerable change in the disposition of such children can be brought about by pituitary medication. The evidence, however, is not compelling because, so far as I know, none of the therapeutic studies have been adequately controlled. The problem demands further attention.

Of the adrenals as determinants of personality, not much is known. In its function of integrating the body for vigorous muscular activity the hormone, adrenine, plays at least a secondary role. In those whose way of life permits vigorous response to emotional demands the discharge of adrenine no doubt adds to efficiency and habitual success has an invigorating effect upon the personality. It is probable, however, that for those who have need to react to emergencies only by calmness of demeanor and quiet thinking, the primitive mechanism is an actual detriment. The adrenal cortex plays a part in the regulation of sex functions and of milk secretion, in growth and in the determination of bodily vigor. It is probable, therefore, that it has a significant influence upon the instinctual tensions but data to substantiate the guess are largely lacking.

Passing mention may be made of insulin as a factor in behavior. Occasional instances are encountered in which an over-facile discharge of the pancreatic hormone leads to instability of carbohydrate metabolism and the consequent frequent occurrence of hypoglycemia. This may exist as a chronic episodical condition and the nervousness, irritability and weakness that result may figure significantly in determining the every day personality. The condition has occasionally led to a diagnosis of neurasthenia, hysteria and even dementia praecox. Whether it ever gives rise to important maladjustments in social relationships would bear study.

No attempt has been made to offer a complete presentation of the data bearing on the relationship of the hormones to personality and behavior. The subject has been treated at greater length, elsewhere.[7] The purpose of this paper is rather to solicit attention to the important problems that are involved. Psychopathologists lay a great deal of stress upon the instinctual drives as major factors in psychodynamics. However, investigators in this field have made almost no use of the hormones as means for the validation of their theories. The endocrinologists in their turn have shied away from the intangibilities of psychology. The result is that the psychological aspects of endocrinology—and these are probably the most important in relation to personal adaptation—have been left in large measure unstudied. Of the hormones as tools for the systematic exploration of personality almost no use has been made.

As the general practitioner recognizes the need of giving increasing consideration to psychopathology his attention will necessarily be further drawn to the endocrine aspects of the problems. The endocrinologists venture to hope that out of this interest will grow a desire to co-operate more extensively in the solution of the many difficult and complex problems that are presented. Some aspects of the researches can best be carried out by specialists in their laboratories but for the study of the gradual evolution of personality and of the influence of hormone factors therein, the general practitioner has unique opportunities.

Summary

Attention is drawn to a transition that is now taking place in medical practice and to the desirability of greater attention by the general practitioner to psychopathology. Basic to such studies is the psychobiology of the individual, in which endocrine factors are important.

A few of the outstanding influences of hormones on behavior as an index of personality are cited.

The field discussed is largely undeveloped and the aid of the general practitioner in the solution of the many complex problems presented is solicited.

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The Physiological Roles and the Clinical Significance of the Endocrine Glands

A Review*

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IN ADDITION to those marvelous natural agencies of bodily defense which were so clearly described in last week's lecture, there are other equally amazing physiological mechanisms which more or less automatically govern the inner lives of both mice and men from the moment of individual conception to the time when a new generation has been insured. These mechanisms depend upon the activities of two great coordinating agencies, the involuntary or autonomic nervous system and the widely separated but functionally interrelated structures known as the endocrine or ductless glands. While the functions of these two systems are so intimately interrelated that they are frequently considered together under the qualifying term "neuro-endocrine," it is beyond the scope of the present review to make any but the briefest reference to the special role of the nervous system.

Most of our knowledge concerning the endocrine glands has been acquired during the past half century—indeed, the major portion of it within the last twenty-five years. At the present time new discoveries in this important field are being reported in the biological, medical and chemical literature at so great a rate that no single investigator can possibly keep himself completely informed on every phase of the subject. What a full century of progress along the same lines and at the same pace might mean for the human race, you may estimate for yourselves at the end of our discussion.

For the sake of orientation a few preliminary remarks may be made regarding some basic peculiarities of the complex living body which these glands serve. As everyone knows, the stuff of which we are made is extraordinarily unstable, and yet we are capable of surviving the vicissitudes of a rigorous, ever-changing, external environment to far out-live most other continuously working machines, though the latter are constructed of the most durable metals. This survival is made possible by a high degree of functional specialization on the part of our many organs and by the unique power of self-repair possessed by the vast multitude of tiny cells which compose them. In addition, of course, there must be constant and complete co-operation between the organ systems or the whole mechanism might go into a veritable "nosedive." It is the joint function of the involuntary nervous system and the endocrine glands to co-ordinate these varied activities.

Although we are accustomed to regarding ourselves as air-inhabiting creatures, we are, as a matter of fact, as truly aquatic as the ameba or the gold fish. The dead epithelial cells of our skin form a dry, scaly outer coat which protects the underlying live cells from the air. Like the freely floating corpuscles of the blood, the stationary living cells composing our different organs are constantly bathed by watery lymph and blood plasma. From these continuously moving fluids they derive their entire sustenance and into it they discharge their wastes and certain of the special secretions which they may elaborate. The fluids of the body, therefore, constitute an internal environment for all living cells. As first suggested by the great pioneer of modern physiology, Claude Bernard, it is the maintenance of relative constancy in the temperature and the chemical composition of this internal environment which makes possible the free and independent life of the higher organism.

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A few illustrations of the delicate adjustments required for normal life may be referred to. For instance, whether the atmospheric temperature is 30° below zero or 130° above, that of the body's internal environment is normally maintained within the narrow limits between 98° and 100° F. This degree of constancy is made possible by the body's elaborate heating and cooling systems, which are under the control of a most vigilant physiological thermostat. The blood pressure and the volume of circulating blood must be kept within certain well known limits to provide adequate transportation facilities between the various organs. The concentration of colloidal substances in the blood serum, particularly the proteins, must be maintained above a certain critical level or we develop edema; that is, the body becomes dropsical or water-logged. A delicate balance between the mineral elements of the body fluids governs the irritability of our nerves and muscles and in large part determines the rhythmical action of our hearts. When for any reason the amount of calcium in the blood serum falls far below its normal concentration of about one part in ten thousand, without a corresponding shift in the other mineral elements, distressing muscular spasms occur and generalized convulsions may result. In health the maintenance of a more or less constant amount of sugar in the circulating blood insures a readily available supply of energy for the cells of the body at all times. The excess of sugar derived from the diet goes to the liver and muscles, where it is converted into animal starch or glycogen and stored for future use. When the sugar requirements of other actively working organs is greater than that which can easily be satisfied by the amount already in the blood, the liver somehow "gets wind" of this and, like a good neighbor, splits some of its stored glycogen into simpler molecules of the soluble sugar, glucose, and sends it by way of the rapidly circulating blood to meet the emergency. If this co-operative mechanism fails, a condition known as hypoglycemia, or too-low blood sugar soon develops, giving rise to a train of bizarre subjective symptoms and finally to convulsions or even death, unless sugar is administered. The oxygen content of the arterial blood must be steadily maintained above a certain level or queer things may happen to us, such as fainting. The hydrogen ion concentration of the body fluids, that is, their degree of acidity or alkalinity, is so delicately adjusted that any deviation beyond the relatively narrow range represented by distilled water on the acid side and ordinary tap water on the alkaline side results at once in alarming symptoms, because practically all of the essential chemical reactions of the body depend upon the stability of this factor. The foregoing examples represent but a small fraction of the long list of special adjustments, which together constitute the so-called "steady state" of the body or what Professor Cannon of Harvard prefers to call "homeostasis."

All such phenomena as these and others yet more complex, including reproduction, lactation, digestion, growth and development, are now recognized as being either directly or indirectly dependent upon the automatic activity of specific chemical regulators. Intelligence, as used in the ordinary sense, contributes but little to the harmonious operation of these processes. While one small group of our chemical regulators, the vitamins, are obtained from the diet ready made, by far the larger number are fabricated by our own endocrine glands, which may now be considered.

A gland is an organ whose cells elaborate some special substance or group of substances. Higher animals are equipped with two general classes of glands, those having definite systems of ducts to convey their special secretions from the organ and those which possess no such ducts but which pour their chemical products directly into the lymph and blood streams. Familiar examples of the first class are the salivary glands, the pancreas, and the liver. It is the second type, i.e., those without ducts, which are designated as the endocrine glands or the organs of internal secretion. The secretory products which are carried in the blood stream to exert their influences on distant organs, are spoken of as hormones or chemical messengers. These for the most part are comparatively simple chemical substances. A number of them have already been isolated in crystalline form and their chemical structures have been elucidated. In comparison with ordinary drugs, they are amazingly potent, certain of them exerting physiological effects when present in the body fluids in concentrations as low as one part in one billion.

Our knowledge concerning the special functions of the various endocrine glands has been obtained by two methods: first, that of observing the results of Nature's own experiments, namely, the effects of naturally occurring disease of individual glands and, secondly, that of direct experimentation. The latter has been particularly fruitful. In the case of each gland, efforts have been made to learn not only its normal function but also the effects of both under-activity and over-activity. When such information began to accumulate, it soon became apparent that the glands do not function independently but work in unison, as if belonging to a common system. Recognition of this interrelationship has aided greatly in the interpretation of phenomena which would otherwise have remained in the realm of mystery.

The various endocrine glands and their locations in the body are shown in figure 1. These may be pointed out in the order in which they will be discussed. The *thyroid* is a two-lobed structure situated over the front or anterior aspect of the neck just below the level of the larynx or voice box. Lying back of the thyroid and closely adherent to it at points which might be said to represent its four corners are the four tiny *parathyroids*. Just beneath the sternum or breast bone the *thymus gland* spreads out over the upper part of the heart, covering the great vessels and the trachea. The *pineal* gland, a small body shaped like a pine cone, as the name indicates, is attached to the base of the brain. Just above or slightly in front of the upper poles of the kidneys are the two grotesquely shaped *adrenal glands*, which bear a superficial resemblance to the cocked hat of colonial times. The *pancreas* or "sweet-bread" gland lies across the upper portion of the abdominal cavity with its so-called "head" bent downward in close apposition to the duodenum or upper part of the small intestine and its tail extending toward the spleen on the left. The major portion of the pancreas does not function as an endocrine gland but widely scattered within its substance are numerous small groups or islands of specially differentiated cells, which have no connection with the duct system of the gland, but which empty their secretion directly into the blood capillaries. These so-called

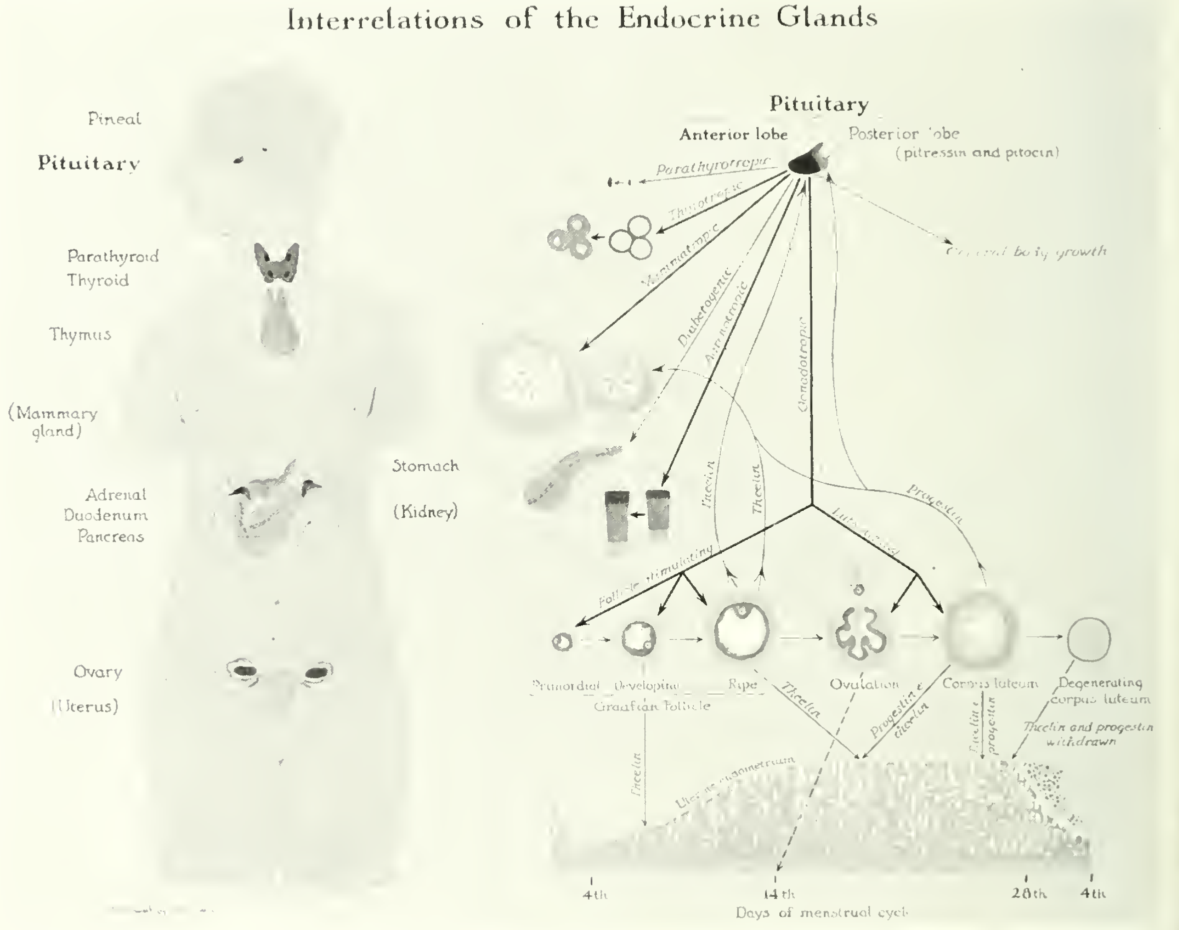


FIGURE 1

A composite diagram to indicate the location of the principal endocrine organs and the multiple hormonal activities of the pituitary gland. The outline of the human form represents that of a 14-year-old female. The female sexual cycle with interaction between the female sex hormones and the pituitary are presented somewhat in detail. To avoid confusion the gonadotropic effect in the male subject is not included. (Adapted from various sources by Jean E. Hirsch.)

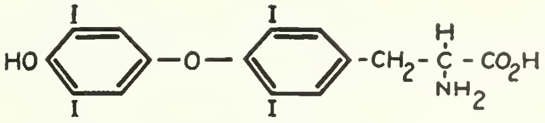
islets of Langerhans are true representatives of the endocrine system. The hypophysis or *pituitary gland,* probably the most important of all, is securely situated at the base of the brain in a saddle-shaped, bony depression, known as the sella turcica or Turkish saddle. It is connected with the brain structures above by means of a small pedicle, known as the pituitary stock. In addition to producing germ cells, the *sex glands,* ovaries in the female and testes in the male, elaborate special hormones which serve a variety of functions. The lower or pyloric end of the *stomach,* and probably the *liver,* also, produces a substance which is essential for the normal manufacture of red blood cells in the bone marrow. Deficiency in the production of this antianemic factor is the cause of the one-time fatal disease, pernicious anemia. The inner lining of the duodenum or upper end of the *small* intestine elaborates at least three hormones which perform essential functions in the automatic control of the motor and secretory activities of the digestive tract.

The Thyroid Gland

Not until late in the nineteenth century was the thyroid gland recognized by physicians to be of fundamental importance to life. At that time (1873) Gull, an English surgeon, first suspected disease of the gland in a number of middle-aged women, whom he described as having a peculiar type of obesity, puffiness of the face, loss of physical and mental vigor, and falling out of the hair. The postmortem examination on such a patient, made a few years later by Orb, showed the thyroid gland to be almost completely atrophied. The finding of a large accumulation of mucilaginous looking material in the tissues under the skin of these victims resulted in the condition's being designated as *myxedema,* which means "mucinous swelling." Soon after this it was recognized that cretinism, a condition in infants and children characterized by marked retardation of both mental and physical development, is likewise due to absence or extreme underactivity of the thyroid gland. Confirmation of these relationships was obtained from the errors of the first operations for goiter, when it was recognized that complete removal of the diseased gland resulted in the production of myxedema. Of course, surgeons soon learned that the goiterous gland should not be removed in its entirety but that enough should be left to carry on the normal function.

The next great step was taken when living thyroid gland substance was successfully implanted or grafted into the tissues of a patient with myxedema. Finding that the symptoms of the disorder disappeared for a considerable period of time, i.e., until the graft finally died out, intrepid investigators next injected emulsions of thyroid material hypodermically in such patients. This was likewise successful in relieving the symptoms, but as a method of treatment regular injections did not come into common use, because it was soon discovered that administration by mouth is just as effective and far more convenient for the patient. The significant discovery by Magnus-Levy in 1895, that the rate of metabolism or oxidation within the body is greatly reduced in persons with cretinism or myxedema but markedly increased in exophthalmic goiter, an over-active state of the gland, not only added significantly to our knowledge of thyroid function but afforded a new practical test to aid in the diagnosis and treatment of all thyroid disorders.

The active principle of the thyroid gland was finally isolated just twenty years ago by the American biochemist, Kendall, who gave it the name *thyroxin.* He found it to be a highly potent but comparatively simple compound, containing sixty-five per cent iodine. In 1926 its chemical structure was further elucidated by Harrington, a British chemist, who later developed a practical method for its synthesis from simpler compounds. Because of this final achievement, it may be said that we now know more regarding the thyroid gland, its normal functions, its disorders and their treatment, than we do about any other endocrine gland. Our ultimate aim in the case of each of the other glands is to gain similar knowledge. The chemical constitution of thyroxin is represented by the following graphic formula:



The mildest form of thyroid disease is *simple* or *adolescent goiter,* sometimes spoken of as *endemic* goiter, because it occurs with especially great frequency in certain parts of the world called "goiter belts." It is caused by a deficiency of iodine in the water and food in such localities. The mountainous areas of Switzerland and Austria and the Great Lakes region in America are examples of low-iodine regions. The disease tends to develop with particular frequency in children between the ages of ten and sixteen years. The swelling of the gland is due largely to the accumulation of a viscid or colloidal secretion. This is thought to be produced in excessive amounts in an attempt on the part of the gland to compensate for its poor quality. Administration of iodine results in the prevention or cure of this type of thyroid disease. From a survey in the schools of Cleveland and other cities of the Great Lakes region, Marine and Kimball some years ago found that between seventy and ninety per cent of girls and a somewhat lower percentage of boys of junior high-school age had noticeable degrees of simple goiter. By adding iodine to the table salt or giving it to the children in small daily doses for a month at a time twice yearly, these investigators were able to reduce the incidence of goiter almost to the vanishing point.

Cretinism, or extreme childhood myxedema, is seen far more frequently in goiter regions than elsewhere but occurs sporadically in all parts of the world. The child born with an undeveloped or atrophied thyroid gland can be recognized at once because the signs of cretinism or infantile myxedema are unmistakable. The victim is a puffy and misshapen creature with a thick, protruding tongue, too large for his mouth. Because of this he is often unable to nurse and must be fed artificially. His cry has a coarse, brassy quality. If he lives but receives no specific treatment, his physical development is markedly retarded and the higher nervous system remains undeveloped functionally, so that his intelligence ranges between feeblemindedness and complete idiocy. The face is wholly lacking in animation. The blunt nose becomes flat and somewhat saddle-shaped. The eyelids and lips thicken. The mouth gapes and drools saliva constantly. Deafness is not infrequently present. The skin becomes dry and thick with a dull, muddy tinge. The hands and feet are broad and clumsy. The abdomen protrudes. The breathing is slow but noisy. The pulse is slow. The body temperature is subnormal, because his metabolic fires burn low. X-ray examination of the bones shows their development to be extremely retarded. The teeth erupt late and are scraggly and of poor quality. Such is the picture of extreme thyroid deficiency in early childhood. When a similar misfortune comes to an adult who has previously been normal, retrogressive changes of both body and mind finally produce a similar clinical picture, already referred to as myxedema.

If the thyroid deficiency in such patients as these is made up by administration of thyroid extract or of pure thyroxin, the beneficial effects are usually phenomenal. The swollen tissues of the body give up their pathological stores of water and the cellular nutrition tends to return to normal, as shown by metabolism tests. Facial dullness is superceded by animation and the disposition improves immeasurably. Mental keenness returns and, in the case of a child, growth and development proceed very rapidly. The earlier treatment is begun in the case of childhood myxedema the greater are the chances for normal development. A condition of "masked hypothyroidism" or mild under function of the gland is far more common than these extreme cases. Thyroid treatment greatly benefits such persons.

In contrast with the foregoing picture of hypothyroidism is that of pathological *hyperthyroidism*, as manifested in exophthalmic goiter. The thyroid is usually enlarged to a noticeable degree, although it may not be. The metabolic or chemical processes of the body are markedly speeded up, the rate of heat production, an accurate measure of these, may be increased at times as much as 50 or even 75 per cent. This results in excessive loss of weight and increased fatiguability. The pulse is forceful and its rate is markedly increased. The blood pressure is increased. The skin is flushed, warm and moist. The breathing is shallow and rapid. The patient feels unbearably warm in an atmosphere where normal people may feel cool. The glistening eyeballs protrude from their sockets with the lids widely separated, giving the subject a startled expression. The face is anxious. Restlessness or nervousness become more and more marked until in severe cases the excited state may not easily be differentiated from a form of psychosis with dissociation of thought, confused delusions, and hallucinations of sight, hearing and other senses. In such a state, often spoken of as a thyroid crisis, the body temperature may be greatly elevated, the heart may become still more over-active and irregular and profuse diarrhea may occur. At the height of such an episode sudden death may result from failure of the heart.

The present day treatment of such hyperthyroidism consists in decreasing the amount of thyroid secretion. After the patient has been subjected to conservative iodine medication and quieting influences for a period of time, a portion of the gland is removed, a sufficient remnant being left to carry on normal function. Following a successful operation, the symptoms are relieved and the patient's condition gradually returns to normal. Thyroxin is an astonishingly potent hormone. By its excessive administration many of the symptoms of hyperthyroidism can be reproduced. It has been estimated that, under normal conditions, three and one-half grains of thyroxin suffices for a year. Yet, as Hoskins says in his admirable book, "The Tides of Life," this small pinch of thyroxin spells all the difference between raving delirium or imbecility and normal health.

The Parathyroid Glands

The parathyroid glands are so small and inconspicuous that they were not discovered to be separate organs functionally distinct from the thyroid until 1881. It was then discovered that certain symptoms which had earlier been observed to follow complete removal of the thyroid gland were actually due not to loss of thyroid but to loss of parathyroid function. Within a few hours after such an operation the operated subject begins to show tenseness and fine tremors of the muscles. As this increases one muscle after another goes into painful cramps. The body reflexes are markedly hyperactive. The laryngeal muscles contract, making breathing and phonation difficult. One of the chief functions of these tiny glands is that of maintaining the calcium of the body fluids at a more or less constant level. Loss of this power results in a serious decrease in the serum calcium. This in turn causes the marked increase in nervous and muscular irritability. Unless treatment is given, convulsions are prone to occur and finally death results. This condition of parathyroid deficiency or *tetany* occurs spontaneously in children and adults as a result of atrophy or infection in the gland. Infants, deprived of both direct sunshine and the rickets-preventing vitamin D, may develop a form of tetany almost identical with this. The parathyroids are undoubtedly involved in the latter form of tetany also.

Extraction of the active hormone of the parathyroid glands was achieved independently in the same year by Hanson and by Collip. When this potent extract is administered hypodermically, the signs of tetany promptly disappear and remain in abeyance if a small dose is given daily. It has recently been found that large doses of vitamin D have a similar but less dramatic effect. If properly administered, calcium is also effective in relieving the symptoms. When excessive quantities of parathyroid extract are administered to dogs, calcium is removed from its stores in the bone, the amount in the blood and urine is greatly increased, the blood becomes thick, and the animal may die from a state of shock if the injections are continued.

Within recent years it has been found that tumor growths of the parathyroid glands or an increase in the number of active gland cells produces a condition equivalent to chronic over-dosage of the extract. In patients suffering from this disorder, the symptoms are, as one would expect, just the opposite from those of tetany, i. e., somnolence, general lassitude, neuro-muscular hypotonia, constipation, great thirst and an excessive output of urine which contains greatly increased amounts of calcium and phosphorus. Because of this latter condition, stones composed of calcium phosphate are frequently formed in the kidneys. There is a marked generalized loss of calcium and phosphorus from the bones. As bone is lost in local areas, it is replaced by irregular, fibrous, tumor masses some of which soften to form cysts. When widespread, this latter condition is sometimes spoken of as *osteitis fibrosa cistica*. Such cyst-containing bones become greatly weakened and so are easily fractured or bent, leading to horrible deformities. Surgical removal of the diseased portions of the parathyroid glands usually results in a spectacular reversal of these abnormal processes with disappearance of all symptoms and a fairly rapid recalcification of the bones.

The Thymus Gland

The thymus has often been referred to as the gland of childhood because it is largest at this period of life. It grows in size steadily up to the time of puberty but decreases rapidly thereafter as the sex glands become active. Although it has long been an object of study, clear-cut evidence of its producing a specific hormone has been almost entirely wanting until very recently. Among the many bizarre suggestions made by uncritical writers respecting its possible role in human life, the most absurd was that its persistence after the age of puberty is connected in a causative way with a more or less specific tendency to criminality, suicide, gangsterism and drug addiction!

That its chief function has to do with body development and growth and the metabolism of lime salts has long been indicated. When thymus substance is fed to young tadpoles they grow to unusually large size and their metamorphosis or change to the frog state is much delayed, whereas, thyroid feeding has the opposite effects. That it is in some way connected with sex development in man is indicated by the fact that the secondary sex characters do not develop normally, if the thymus does not undergo involution or shrinking at the usual time. The thymus does not atrophy or decrease in size at the age of puberty if the sex glands have failed to develop or have been removed previously. Destructive disease or extirpation of the adrenal gland causes an enlargement of the thymus. Overactivity of the thyroid has a similar effect.

As regards the influence of the thymus on calcium metabolism, the first convincing evidence was derived from studies on birds. It was early found that pullets, after having their thymus glands removed, laid eggs lacking in shells. Finding that certain pigeons without any such operation laid eggs devoid of shells, Riddle treated them with thymus extracts, with the result that normal eggs were produced.

Very recently Rowntree, Hanson and their co-workers have added a new and interesting chapter to our knowledge of this elusive gland. Following the daily injection of a relatively potent thymus extract into the peritoneal cavity of rats from the time of birth until they bore young, these workers observed the offspring to be unusually large and precocious in their development. This tendency in the offspring was markedly increased when the parent rats in succeeding generations continued to receive injections. In the later generations the offspring were as far advanced in size and development, both physically and in respect to behavior, at the age of three days as normal control rats are at the age of nearly three weeks. Whereas, normal rats are born hairless, do not open their eyes until the fourteenth day and cannot be weaned before this time, the offspring of the fifth and sixth generations of thymus-treated rats were found to have heavy coats of fur, to open their eyes and to fend for themselves without nursing their mothers at the age of three or four days. The fertility of the rats was appreciably increased. The mortality rate of the offspring was greatly reduced and the onset of adolescence was hastened. The marked degree of speeding up of the latter process was illustrated by the performance of one mother rat which bred at the age of twenty-two days instead of the normal age of between seventy-two and ninety days and cast a litter of precocious rats at the age of forty-three days. Four days before the birth of her offspring she weighed 102 grams. Her five baby rats together are said to have weighed 90 grams at birth! When instead of receiving injections of thymus extract, successive generations of parent rats had their thymus glands removed, it was found that their offspring, although born at the usual time, were much smaller than normal rats and were much slower in developing.

The Pineal Gland

The pineal, though no larger than a cherry pit, has been known for a very long time, having originally been regarded as the "seat of the soul." Unfortunately, even today we are far from being in possession of full knowledge concerning the normal function of this structure. At present we know merely that tumors of the gland cause a condition known as pubertas praecox or *macrogenitosomia praecox*, which means, "early enlargement of the genital organs and the body." The striking features of this fortunately rare disorder, which occurs almost exclusively in boys, are rapid body growth, early completion of bone development, appearance of coarse axillary and pubic hair, precocious development of the sex organs and functions, low voice and frequently precocious mental development. Someone has described such a patient as a "Hercules in miniature." Such victims usually die early from pressure of the tumor on the brain.

On the assumption that the tumor has a destructive effect on the gland, it has been suggested that the normal function of the pineal is to prevent the too early development of the body and particularly of the sex organs. Hanson has recently obtained an extract from the pineal of animals which, when injected into parent rats in successive generations, apparently produces dwarfed offspring. In striking contrast to the effect of thymus extract under similar circumstances, this material results in an unmistakable delay in development. Much further experimental work will be required before we can tell what part this gland normally plays in animal economy.

The Adrenal Gland

The adrenal or suprarenal glands are composed of two anatomically and functionally distinct parts, a central or medullar portion and an outer or cortical portion. In some of the lower animals the two portions are entirely separated. In these animals the cortical structure is spoken of as the interrenal body because of its position between the kidneys. The function of the adrenal medulla has been known for some years, whereas, that of the cortex has but recently begun to be elucidated.

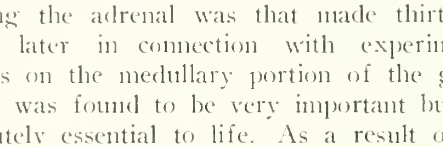
The abnormal increase in body growth and premature sex development already described in the case of pineal tumor as macrogenitosomia praecox, occurs even more frequently as a result of tumor or overgrowth of the adrenal cortex. Whereas pineal tumors have been found to occur five or six times as frequently in boys as in girls, there are three or four female sufferers from adrenal cortical tumors to every male victim of this disorder. Certain tumors of the sex glands likewise cause this distressing clinical conditon, the sexes suffering about equally. In little girls who manifest evidence of the disease before the age of puberty, there is hirsuitism or premature appearance of body hair of the adult type, obesity and untimely development of the primary and secondary sex characters with menstruation at times as early as the age of five or six years. It is not to be wondered at that tumors of the adrenal cortex and of the sex glands produce the same clinical disturbances, when it is known that these widely separated glands have similar embryological origins and are interrelated in their functions throughout life. The condition is frequently spoken of as the adrenal cortical syndrome or *interrenalism*, however, because it is most frequently due to disease of this gland, either tumor or hyperplasia, that is, a diffuse increase in the amount of active glandular tissue present.

When the latter disorder occurs in adults, the picture is somewhat different from that seen in children in that the primary and secondary sex characters and functions early tend to show regression as contrasted with the precocious development seen in children. Women are much more frequently afflicted than men and it is this disorder which most frequently accounts for the bearded women occasionally featured in the lay press. In adult women the most striking features of this disorder, also spoken of as virilism, are the following: abnormal growth of hair on the face and body with masculine distribution, cessation of menstruation, profound muscular weakness, a peculiar swelling and high color of the face, high blood pressure and excessive deposition of fat over the trunk but not over the extremities. The development of moderately severe sugar diabetes is not an infrequent complication. In addition most patients show some degree of cyanosis or blueness of the hands and feet and purplish striae, or lines, over the abdomen, thighs and chest and a moderate degree of rarefaction of the bones, as demonstrated by X-ray. The number of red cells in the blood is greatly increased. On the psychological side, irritability or impulsiveness, loss of modesty and lack of interest in the opposite sex are frequently noted. Men who are afflicted with this type of adrenal tumor develop a similar general appearance and suffer from the same symptoms. Sexual atrophy always occurs and the victim shows a definite tendency to feminization, resulting in a higher pitched voice and a female type of obesity with well-developed breasts, which are in some instances capable of secreting milk. A number of cases due to tumors, which could be successfully removed, have recovered very largely after the operation. In cases showing hyperplasia instead of tumor, excision of a part of the hyperplastic glandular tissue is said to result in an amelioration of symptoms.

Tumors of the medullary portion of the adrenal gland produce an entirely different group of symptoms, the most important of which are attacks of high blood pressure occurring paroxysmally or periodically in association with increased rapidity of the pulse and pounding of the heart. An accompanying increase in the level of the blood sugar aids in distinguishing this condition from the ordinary type of high blood pressure. Fortunately, early removal of such tumors may result in a complete cure in many such cases.

The first correct clue regarding the normal function of the adrenal glands was reported in 1855 by the British physician, Thomas Addison, whose name has ever since been connected with the clinical syndrome associated with destructive disease of the glands. While our knowledge of the disease process and its treatment has increased greatly during the past few years, Addison's original description of its main clinical features has not been surpassed. He wrote, "The leading and characteristic features of the morbid states to which I would direct attention are anemia, general languor and debility, remarkable feebleness of the heart's action, irritability of the stomach and a peculiar change in colour of the skin occurring in connection with a diseased condition of the suprarenal capsules. This singular dingy or dark coloration usually increases with the advance of the disease; the anemia, languor, failure of appetite and feebleness of the heart become aggravated; the body wastes; the pulse becomes smaller and weaker, and without any special complaint of pain or uneasiness the patient at length gradually sinks and expires." The most common cause is tuberculosis but destructive tumor, hemorrhage or atrophy of the glands may produce the same effect. Soon after Addison made his report, the French physiologist, Brown-Sequard, found that complete removal of the glands in cats and dogs produces a similar clinical condition, resulting in death after a few days.

The next forward step in our knowledge concerning the adrenal was that made thirty-five years later in connection with experimental studies on the medullary portion of the gland, which was found to be very important but not absolutely essential to life. As a result of the pioneer work of Oliver and Shafer of England, its active principle was the first of the hormones of the body to be isolated in highly concentrated form. Soon thereafter the chemical constitution of the hormone was determined and its synthesis achieved by a series of contributions made by three American scientists, Abel, Takamine and Aldrich. In medical practice this hormone is now widely used in the treatment of bronchial asthma under the name *epinephrine* or adrenaline. It has gained a newspaper reputation as the drug which is injected into the heart to "bring the dead back to life" in cases of sudden shock or in certain forms of poisoning. Its chemical constitution is represented by the following graphic formula:



The medullary part of the adrenal gland has a very intimate relationship with the sympathetic nervous system, as might be expected from the fact that the two have a common embryological origin. It is now known, through the work of Elliot, that the hormone from the medulla has precisely the same effects on the body as stimulation of the sympathetic nervous system. Although Cannon has demonstrated by its complete removal in the cat that the latter system is not absolutely essential to life, it is recognized as exercising an important regulatory influence upon many of our involuntary vital activities, such as the maintenance of body temperature. When suddenly stimulated, it causes a remarkable mélange of effects. The pupils of the eye dilate; the skin becomes pale and in lower animals the hairs rise. The activities of the digestive tract promptly cease and the blood supply to it and other internal organs is mostly transferred to the muscles. With the visceral blood vessels thus contracted and with the heart beating faster and more forcefully the general blood pressure is markedly increased. At the same time, instead of contracting, the blood vessels in the muscles open wider to receive a greater supply of blood. The bronchial tubes going to the lungs are dilated. Epinephrine is released. Extra sugar is discharged from the liver stores into the circulating blood. The spleen contracts, forcing additional blood into the general circulation. The ability of the blood to coagulate quickly is increased, thus curtailing the danger from hemorrhage. From these observations and the fact that detectable amounts of epinephrine occur in the circulating blood in times of special stress only, Professor Cannon was led to formulate an "emergency theory" regarding the function of the adrenal medulla. According to this, the adrenals, like "Minute Men," are ready at all times to pour their highly potent medullary hormone into the circulating blood to reinforce and sustain the sympathetic system in its mobilization of the body's physiological resources for defense or attack. Everyone has witnessed these reactions following the sudden meeting of a strange dog and cat and all but the angels have experienced the subjective effects of sudden fright, pain, anger or other strong emotion. As Hoskins points out, this conception also supplies a physiological basis for the frequently expressed aphorism, "Worry is worse than work."

In spite of the great importance of the medullary part of the adrenals, it is not absolutely essential to life, whereas the cortex of the gland is. Renewed interest in this latter part of the gland has followed the recent successful isolation by several investigators (Stewart and Rogoff, Hartman and Swingle and Pfiffner) of a potent hormone, which is capable of maintaining life in completely adrenalectomized animals as well as ameliorating the symptoms of Addison's disease. Kendal has obtained the active principle, *cortin* or *interrenin*, in crystalline form.

Further study of the problem of adrenal cortical insufficiency has shown that one of the chief functions of this gland is to regulate the activity of the kidneys. The excessive loss of the element, sodium, and therefore of water, from the body by way of the kidneys accounts in part at least for most of the symptoms of adrenal insufficiency. The sodium and chloride of the blood, the blood plasma volume, rate of blood flow, consumption of oxygen, the blood pressure and the body weight are all reduced, while the blood proteins, urea and potassium are greatly increased. As shown by Loeb and by Harrop, giving large amounts of sodium in the form of a mixture of common salt and baking soda causes a marked amelioration of all of the symptoms of Addison's disease just as administration of cortical extract does, but alone it is not sufficient to maintain life indefinitely. The cortical hormone appears to be indispensible in times of adrenal crisis. Much more work must be carried out to complete our knowledge concerning the functions of this important gland.

The Pancreas

The disease, sugar diabetes, now known to be due to a deficiency in the internal secretion of the pancreas, was apparently known to the writer of the earliest medical document which we possess, the papyrus Ebers, dating from approximately 1500 B. C., i.e., three centuries before the birth of Moses and a thousand years before Hippocrates, the father of Medicine. Before the beginning of the Christian era Greek physicians had described some of the cardinal symptoms and signs of uncontrolled diabetes, i.e., excessive thirst, drinking and passing of enormous amounts of water, marked loss of weight and feeling of weakness in spite of the inordinate consumption of food. Sweetness of diabetic urine was first mentioned in the sixth century A. D. by a Hindu writer who called the disease *Madhumcha*, meaning "honey urine." This quality of the kidney secretion of diabetic patients was discovered quite independently by Thomas Willis, an English medical worthy of the seventeenth century. His curiosity led him to taste the urine voided so copiously and, much to his surprise, he found it "wonderfully sweet, as if imbued with honey or sugar." A century later the surmise of Willis was confirmed, when Dobson evaporated diabetic urine and obtained a cake of sugar.

The next great step toward the solution of the mystery of diabetes was taken when Minkowsky and von Mehring, working in the world-famous diabetic clinic of Naunyn of Strassburg, removed the pancreas to determine whether or not it is essential to life. When he observed that flies settled where the depancreatized dogs had passed urine, Naunyn is said to have advised his assistant, Minkowsky, to test the animals' urine for sugar. The tests showed the urine to contain large amounts of sugar. As so frequently happens in scientific research, the important observation here was a by-product of an investigation designed for another purpose—another example of "chance favoring the prepared mind." Thereafter, the pancreas was known to be the seat of trouble in diabetes mellitus, and not the kidneys, as previously held. The next important contribution to the subject was the discovery by Opie, a young American pathologist, that certain specialized structures in the pancreas, the islands of Langerhans, are the particular seats of trouble in diabetes. Microscopic examination of the pancreas in people dying from the disease showed pathological changes in these parts of the gland only. He found also that by tying off the pancreatic ducts the main or acinar portion of the pancreas could be made to undergo atrophy without injury to the Langerhans cells, which have no connection with the duct system. Dogs treated in this way did not develop diabetes.

In spite of many attempts to isolate the active antidiabetic principle from the pancreas in sufficiently pure condition for treatment of patients, no satisfactory method was devised until 1922. Banting and Best of Toronto then took up the problem by making an extract of dog pancreas which had previously been prepared by ligation of the ducts to destroy all but the islet tissue. They succeeded in obtaining an extract which would reduce the amount of sugar in the blood and urine of other dogs which had been made diabetic by complete removal of the pancreas. With the aid of the biochemist, Collip, they were soon able to prepare the hormone in a form which could be injected under the skin of human diabetics. This final success was heralded the world over and within a few years thousands of previously doomed sufferers were daily employing this life-saving remedy which was given the name, *insulin*. Before the advent of this great boon, practically all children who developed diabetes died within five or six years in spite of the most skillfully prepared diets. Surgical operations on diabetic patients in the pre-insulin era were attended with great danger. Today, however, neither of these special situations concerns the doctor seriously because he is enabled by the proper use of insulin to control the diabetic tendency. In the days before insulin was available, the majority of diabetic patients who died from the disease developed a severe form of acidosis due to accumulation in the body of acid products resulting from the incomplete or faulty burning of fats, which is a secondary manifestation of active diabetes. Even today this serious stage may be reached before the victim is aware that he has diabetes. The symptoms of this complication are deep, rapid breathing, excessive loss of body water and alkaline minerals and later uncontrollable drowsiness. Unconsciousness then supervenes and the patient ultimately dies in this comatose state, if insulin is not administered. One of the most dramatic and gratifying results that a practicing physician is privileged to experience is that of literally snatching such a patient from the brink of the grave by the proper use of insulin.

Just as the thyroid is overactive in exophthalmic goiter, so the islands of Langerhans may show a hyperfunctional reaction to tumor or increased growth of its specialized cells. Under this condition, spoken of as hyperinsulinism, the amount of sugar in the circulating blood is decreased to such a low level only a few hours after a meal that the brain, muscles and other organs suffer from a veritable fuel shortage. As a result, the victim develops a typical series of distressing symptoms, exactly like those produced by an overdose of insulin. These at first consist of a feeling of restlessness and weakness or "all-goneness," which many people feel when excessively hungry. Later nervousness or irritability, trembling, cold perspiration and prostration follow. At this time such an individual may be irrational. If no treatment is given, epileptiform convulsions are likely to occur. Taking a lump of candy, a few ounces of orange juice or some other food containing sugar brings quick relief, if given when the first mild symptoms appear. The injection of adrenaline also gives prompt relief because, as pointed out before, this hormone from the adrenal gland increases the blood sugar. Permanent cure of this condition has been obtained in some instances by the surgical removal of a portion of the over-active gland tissue or a tumor, if such is found to be present.

Before leaving the subject of diabetes and the opposite state, hyperinsulinism, it should be said that much still remains to be learned regarding the physiological mechanism of insulin action. That the simple mineral constituents of the body fluids may be concerned in this phase of the metabolism is indicated by some recent investigations carried out by Doctor Thompson and myself. Observing that one of our fifteen-year-old diabetic patients showed an abnormal craving for salt, often consuming as much as three ounces or a small saucedishful in one day, we made a careful study of its effects on his diabetic state and his general health. Much to our surprise it was found that this large amount of sodium chloride or table salt greatly reduced the amount of sugar in the urine, although it had the bad effect of temporarily producing high blood pressure. The chemically related salt, potassium chloride, was found to have the opposite effects, i. e., it caused an increase in the sugar of the urine but reduced the blood pressure. The balance between sodium and potassium appears, therefore, to condition the body's response to insulin and to those hormones which act antagonistically to it.

The Pituitary Gland or Hypophysis

In man the pituitary gland is situated almost exactly in the center of the head. By means of a thin stalk it hangs from the brain like a cherry from a tree and rests securely on the floor of the skull within a saddle-shaped bony recess, known as the sella turcica or "Turkish saddle." If we judge the importance of an endocrine gland by the number of hormones which it furnishes to the body, we must admit with Doctor Cushing that the pituitary is "the leader of the endocrine band." Since through its hormones it directly or indirectly exerts control over more than a half dozen other endocrine organs, it is sometimes spoken of as the "master gland."

The pituitary, like some of the other glands discussed, is composed of at least two and probably three anatomically and functionally separate parts, the anterior or front lobe, the posterior or rear lobe and the intermediate lobe or pars intermedia.

The *posterior lobe*, which, like the adrenal medulla, is derived embryologically from primitive nervous tissue, is known to produce two distinct hormones, as demonstrated by Kamm and his co-workers. These have been isolated in sufficiently concentrated form to permit their use in medical practice. The chief physiological action of the first of these, *pitocin*, is apparently that of stimulating the uterus to contract during certain phases of its career, particularly during child birth. The second active principle, *pitressin*, is the more important of the two in that it evidently serves three different functions. It has a stimulating or toning effect on the involuntary muscle coats of the intestine and the blood vessels, causing these structures to contract when it is administered. This property makes it a valuable adjunct in the treatment of circulatory collapse or shock and in gaseous distension of the intestines. When injected hypodermically, it causes a prompt rise in blood sugar. It thus serves as a potential antagonist to insulin. Finally, this hormone acts on the kidneys to inhibit excessive loss of water from the body. Pitocin or pituitrin is employed by many obstetricians during the third stage of labor, if the uterus fails to contract normally.

When the posterior lobe is destroyed or its function is impaired by disease, the victim suffers from unquenchable thirst, drinks an enormous amount of water and passes a similar quantity of urine. Injury or disease of a certain part of the brain, containing the nerve structures which control the gland, has the same effect. This disturbance is called *diabetes insipidus.* Diabetes means "siphon" or "passing through," while insipidus refers to the nature of the urine, which is "insipid" in that it contains no sugar and only minute traces of salt. Adult victims of this malady have been known to pass as much as ten gallons of urine per day, which is equal to the total amount passed in a similar period of time by thirty normal people. One of our little patients with this disease, a four-year-old boy weighing but twenty-four pounds, passed between eight and nine quarts daily when he first entered the Hospital. On some occasions before he was ever seen by a physician, he drank by actual measurement as much as four gallons of water in one day! At the same time he passed an amount of urine which exceeded his own body weight by as much as twenty-five per cent. When he was treated at the Hospital with one cubic centimeter of pitressin per day, his abnormal thirst disappeared completely and his daily urine volume was reduced to three pints.

Two other practical uses for this hormone may be mentioned. The first is the assistance which it may give in the diagnosis of epilepsy. After it was found that epileptic convulsions tend to occur as a result of water storage in the brain, the author in collaboration with Peeler was able to devise a diagnostic test for this disorder based upon the use of pitressin. When a patient suspected of having the disease is given extra water to drink over a period of a day or two and at the same time is given enough of the water-controling hormone to prevent him from excreting the water as fast as it is taken, he is prone to have an epileptic attack. If he does not have the disease, no spell follows this simple procedure. Thompson, Ziegler and the author used this hormone for treating edema or dropsy on the basis of the observation that extra water is lost from the body after its antidiuretic effect has passed off. The injections temporarily increase the amount of edema fluid, but, when they are discontinued, there is often a tremendous outpouring of fluid, not only that recently stored, but the dropsy fluid as well. Superficially the procedure is somewhat analogous with the priming of a mechanical pump.

The *intermediate lobe* of the pituitary gland elaborates a separate hormone, *intermedin,* which causes expansion of certain pigment cells or chromatophore cells in frogs and other cold-blooded animals. When some of this hormone is injected into the lymph sac of a light-colored speckled frog, his melanophore or pigment cells expand until he is dark all over. While we do not know with certainty just what part this substance plays in human physiology, it has been suggested that it has to do with the function of pigment cells in the retina of the eye, aiding particularly in adjustments to darkness. This gland and the adrenal may play a special role in pigment changes in the skin but, so far, this relationship has not been determined.

The *anterior lobe* of the pituitary gland, which is no larger than a small olive pit, elaborates at least six and probably more hormones. The lobe contains three distinct types of gland cells classified on the basis of their response to staining in microscopic sections by a polychromatic stain. Some acidophilic cells take up the acid dye, eosin, staining red; others, the basophilic cells, take up a basic dye, which is blue, while a third type, the chromophobe cells, do not take either stain. It is thought that the latter are probably not secreting cells but are reserve cells ready to develop into the other types when special need arises. The other two types apparently share the task of manufacturing the several hormones which can be extracted from the gland.

Investigations during the past decade and a half have demonstrated the existence of the following active principles in the anterior lobe: 1, a general body growth-promoting or somatotrophic; 2, a sex stimulating or gonadotropic; 3, a thyroid stimulating or thyrotropic; 4, an adrenal stimulating or interrenotropic; 5, a breast stimulating or mammotropic, and 6, an insulin-inhibiting or diabetogenic hormone. In addition there is a considerable amount of evidence in favor of the existence of a parathyroid stimulating or parathyrotropic hormone. While this is still less certain, the production of an active principle for the regulation of fat metabolism is suggested by certain clinical and experimental data.

A brief description of the effects produced by naturally occurring destructive diseases or experimental removal of the anterior lobe, on the one hand, and a naturally occurring hyperfunctional diseased state or excessive administration of active extracts from the lobe, on the other, will summarize our present knowledge regarding its complex functional activities. In disease of the gland one or several of its functions may be abolished or stimulated or all may be involved at the same time. This possibility for combinations of effects at times presents most variable and complex clinical problems.

Total removal or complete destruction of the gland in early life produces a state of infantalism or physical *dwarfism*. The midgets seen in circuses are usually of this type. Body growth is arrested. The thyroid glands, the adrenals, the gonads and other sex organs, the breasts and the parathyroids remain small and underactive. The victim ages prematurely. The body proportions are far more nearly normal than they are in cretinism, but the size of all structures is markedly reduced. Surprisingly, the mental development is often but little impaired. Destructive disease of the whole gland in adult life was first described by Simmond in 1914. Sufferers from this fortunately rare disorder show extreme wasting of the body, muscular weakness, loss of hair, loss of sex power and finally death, if treatment is not given. Administration of crude extracts of the whole anterior lobe are apparently capable of correcting these abnormalities to a large extent.

Overactivity of the anterior lobe causes the reverse picture, that is, overgrowth of the body, together with enlargement and increased activity of the adrenal cortex, the thyroid gland, the parathyroids and the sex glands. A form of mild diabetes mellitus is produced at the same time. Simple hyperplasia or tumor of the anterior lobe, involving chiefly the eosinophilic cells, is now known to produce symmetrical *gigantism* in young individuals whose normal bone growth has not been completed. Such victims have been known to reach the height of nine feet. If a similar change in the gland makes its appearance in adult life after the skeleton has ceased to grow, an asymmetrical, disfiguring type of overgrowth, spoken of as *acromegaly*, results. This condition is accompanied by the other signs of hyperfunction of the gland in the early stages of its course but, as the disease progresses, signs of subnormal function appear. Tumor or hyperplasia of the basophilic cells has been described by Cushing and others as being responsible for a clinical syndrome, "pituitary basophilism," practically identical with that already described as interrenalism. In a fairly large series of such patients examined postmortem, Crook found a characteristic histological change in the basophilic cells of the anterior lobe, namely, an accumulation of basic staining, hyaline material in their cytoplasm. This change in the pituitary cells, regarded as evidence of secretory activity, was present whether the disease appeared grossly to be in the adrenal, the pituitary or elsewhere.

The various hormones produced by the pituitary gland are indicated in the right half of figure 1. The *somatotropic* or general growth principle was first isolated by Evans and Long in 1922. It stimulates growth of all tissues. Animals dwarfed by early removal of the pituitary show rapid growth following injections of the Evans growth extract. Clinical trials have already demonstrated that dwarfed children can likewise be made to resume normal growth by its use.

The *thyrotropic* or thyroid stimulating hormone, discovered independently by Loeb and by Aron in 1929, is essential to normal thyroid function. Pituitary ablation or marked underfunction results in hypothyroidism. Overactivity of the anterior lobe or injection of potent extracts containing this fraction causes hyperplasia and increased activity of the thyroid. Without the thyroid gland this pituitary hormone has no effect.

The observation that the parathyroid glands undergo hyperplasia as a result of anterior lobe hyperfunction is the chief evidence in favor of the presence of a *parathyrotropic* hormone. Further evidence will be required, however, to determine its existence.

The *interrenotropic* or adrenal stimulating hormone is shown to be a separate active principle by the fact that the adrenals undergo atrophy as a result of destructive disease or experimental ablation of the anterior lobe. Conversely, injections of a crude extract of this lobe result in hypertrophy of the normal adrenal. The purified hormone may prove to be of clinical value in cases of simple adrenal atrophy.

The *lactogenic* hormone or prolactin from the anterior lobe is responsible for milk production by the mammary glands, as shown by several different investigators. During pregnancy an excessive amount of ovarian hormone in the body depresses the secretion of this principle. As shown by Riddle, the mammary gland, even in the male animal, can be made to secrete milk at will by administration of prolactin, if preliminary injections of ovarian hormones have been given to prepare the breast tissue for this function. Under ordinary conditions the continuation of lactation after birth of the offspring is contingent upon continuous secretion of the lactogenic hormone. While it has already been demonstrated that increase in milk production by lactating women follows the administration of this active principle, its clinical use would not appear to be advisable until further details regarding its other effects have been worked out. Incidentally, Riddle has demonstrated that the maternal instinct is aroused even in the virgin or in the male animal by injections of this substance. Such injected animals behave toward newborn animals of the same or even of other species in a manner not unlike that of a parent animal, namely, by retrieving and protecting the young placed in their cages.

There is an abundance of experimental evidence now that the anterior lobe exerts an important influence on the metabolism of carbohydrate and probably also of fat. Houssay in 1924 showed that hypophysectomy in the dog causes a marked increase in the sensitiveness to insulin. Later he showed that hypophysectomy greatly lessens the severity of the diabetes mellitus which results from surgical removal of the pancreas. Evans produced hyperglycemia and glycosuria in normal animals by injection of crude anterior pituitary extracts, which suggests the existence of a *diabetogenic* hormone. Over-production of this factor probably accounts for the diabetic tendency in clinical hyperpituitarism, particularly in acromegaly. Hypofunction of the anterior lobe of both experimental and pathological origin is known to produce hypoglycemia in the fasting subject. Whether or not the pituitary plays an important role in the pathogenesis of true diabetes mellitus, however, remains for future determination. Much evidence of a pituitary influence in fat and protein metabolism has already been accumulated, but its full significance cannot as yet be appraised with accuracy.

Of growing importance from the clinical point of view are the *gonadotropic* hormones of the anterior lobe. Cushing and co-workers observed as early as 1910 that hypophysectomy in dogs was followed by atrophy of the gonads. Evans and Long in 1922 discovered that corpus luteum development in the ovaries was stimulated by anterior lobe extracts. The more exact interrelationship between the pituitary and the gonads began to be elucidated in detail, however, only after P. E. Smith and Zondek and Aschheim independently discovered that hypophyseal implants restore the gonadal functions in hypophysectomized animals and induce precocious sexual maturity in normal animals. In brief, it appears at the present time that the anterior lobe produces two gonadotropic hormones, a *gametokinetic* principle, which stimulates development of the Graafian follicle in the ovary and spermatogenesis in the testis, and a *luteinizing* principle, which stimulates the development of the corpus luteum of the ovary and probably stimulates the interstitial cells of the testis. In pregnancy, even as early as the first few weeks after conception, the blood and urine contain gonadotropic substances in such high concentration that they cause ripening of the Graafian follicle and luteinization in the ovaries of non-pregnant mice or rabbits within one to three days, when pregnancy urine is injected intraperitoneally or intravenously. This phenomenon is the basis of a highly accurate biological test for pregnancy, which has already found wide clinical use. Since certain diseases of the pituitary gland as well as such tumor growths as hydatidiform mole, chorionepithelioma and teratoma, also give these strongly positive urinary tests for the gonadotropic principles, other data must of course be considered in making the differential diagnosis.

The Sex Glands

The primary and secondary sex characters do not develop in either sex, if the gonads are removed or are completely destroyed by disease before puberty sets in. In males the beard fails to appear and the hair of the body is scanty and has the female distribution. Normal male aggressiveness fails to develop. The growth zones of the bones remain open and the long bones continue to grow in length well into the third decade, allowing such persons to become unusually tall. The thymus gland fails to undergo involution at the time of puberty but persists into adult life. The voice remains high pitched. Loss of the male gonads in adult life due to accident or disease usually causes some degree of deterioration, or retrogression toward the same condition. Hair becomes sparse. The patient often loses ambition and physical efficiency. Aggressiveness is diminished. Nevertheless, certain eunuchs have been known to hold important political and business positions, carrying on their responsibilities with striking success.

The depressing effects of losing gonadal function, together with the observation that the sex glands of old people show atrophy, long ago suggested the possibility of restoring youth to elderly subjects by grafting normal glands from young individuals of the same or even of different species. False hopes were thereby aroused in many old people seeking the "fountain of youth," where there was none. While slight temporary benefit, probably psychological in origin, was at first obtained in some cases, it must be admitted that there is as yet no convincing proof of rejuvenation following either sex gland grafting or vasectomy.

The interstitial cells of the male gonads do elaborate a hormone, which has now been isolated and prepared in chemically pure form. Because its formula places it in the sterol group of chemicals, it has been given the name, *testosterone*. (See figure 2.) So far, according to Moore, who first extracted the active principle, it has not been demonstrated that this or any other hormone from the gonads sharpens the intellect, prolongs life, aids digestion and sleep or imparts any of a host of other benefits it is alleged to bestow. The fundamental biologic function of the hormone produced in the male sex gland is merely that of preparing the reproductive and accessory organs for their part in the propagation of the race. As pointed out above, its production is apparently dependent upon stimulation of the interstitial cells of the testis by a gonadotropic principle elaborated by the pituitary. Hypergenitalism or macrogenitosomia praecox, already referred to in our discussions of the pineal gland and the adrenal cortex, occasionally results from a tumor of the special endocrine cells of the testis. Surgical removal of these rare tumors results in a return of the body to an essentially normal state.

In addition to producing the germ cells or ova by which the race is perpetuated, the female sex glands or ovaries produce two distinct regulatory hormones which prepare the female accessory sex organs for the successful carrying out of reproduction. (See figure 1.) Long before birth the ovaries contain numerous young or primordial egg cells, each surrounded by a layer of smaller, less highly differentiated cells. Even during late intrauterine life, some of these egg masses or Graafian follicles, as they are called, show signs of change. The smaller cells surrounding the ovum increases in number. Then, the follicular fluids which they secrete accumulates on one side of the follicle. As first shown by Edgar Allen, this fluid contains a hormone, *theelin*, which is gradually absorbed and distributed by the circulating blood to other parts of the body where it performs its specific functions. As the period of puberty is approached, this process of hormone production becomes more evident, that is, the young girl shows signs of development of her secondary sex characters.

One of the Graafian follicles, lying near the surface of the ovary, instead of regressing as all have done previously, becomes more distended than usual with the follicular fluid and ruptures outwardly. The contained ovum or egg together with the fluid is thus set free into the abdominal cavity, from which it makes its way into the uterus. A yellowish structure, known as the corpus luteum, develops from the inner layer of follicular cells. This produces a second ovarian hormone, *progestin* or *progesterone*, isolated and prepared in chemically pure form by Corner and W. M. Allen.

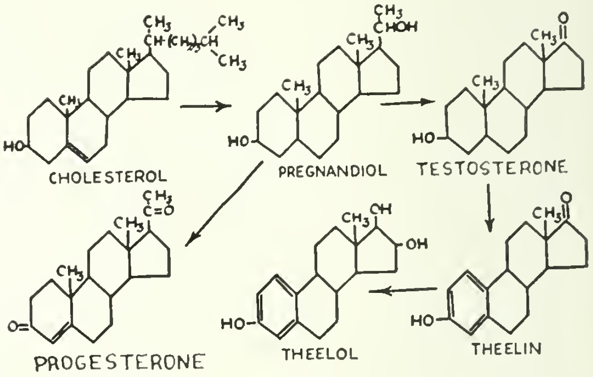


Figure 2.

Showing the chemical constitution of the closely related male and female sex hormones and their possible derivation from cholesterol. Pregnandiol, an intermediate product found at times in the urine along with these hormones, is biologically inactive. Theelol has the same action as theelin. It occurs in the urine but not in the ovary or placenta.

If the released ovum chances to meet and fuse with a male germ cell in passing to the uterus, the process of fertilization occurs and pregnancy follows. The follicular hormone contained in the fluid and the hormone produced subsequently by the corpus luteum sucessively stimulate the inner coat of the uterus or endometrium to develop in such a way as to provide an ideal nesting place for the future embryo. In the event that the ovum is not fertilized, all of the elaborate uterine preparation comes to naught and the thickened inner lining sloughs out. This constitutes menstruation. With the development of a new Graafian follicle under the influence of the pituitary gonadotropic hormone, the same process recurs at intervals of approximately four weeks up to the time of the menopause in late middle life, except when pregnancy intervenes. When pregnancy does not occur, the corpus luteum, whose hormone has been chiefly responsible for the changes in the uterine mucosa, begins to undergo absorption about two weeks from the time of ovulation or discharge of the egg from the follicle. It is at this time of withdrawal of the influence of the corpus luteum that menstruation occurs. In the event of pregnancy, however, the corpus luteum does not degenerate but enlarges and functions throughout pregnancy as an endocrine organ. Its hormone, progestin, has the effect of preserving the favorable physiological state of the placenta during pregnancy and prevents premature uterine contractions.

During pregnancy the estrogenic or follicular hormone, and probably the principle from the corpus luteum as well, exerts a restraining influence on the secretion by the pituitary of the gonadotropic and the lactogenic hormones. At the same time they stimulate the growth and development of the secretory tissue of the mammary gland. With the termination of pregnancy and expulsion of all of the uterine contents, these sex hormones promptly decrease in amount in the body, thus permitting increased secretion of the lactogenic hormone which alone can stimulate milk production. From this brief exposition, it is obvious that the harmonious functioning of these closely interrelated hormonal mechanisms is absolutely essential to reproduction. The successful preparation of the chemically related female sex hormones in essentially pure form, as indicated in figure 2, now offers many new lines of investigation. The significant discovery that the follicular hormone and its chemical allies derived from coal tar are capable of initiating the development of cancer, when applied to the ear of a mouse or rabbit, offers a new approach to the study of that dreaded disease. At the same time it warns against the haphazard clinical use of these new products. However, because administration of the follicular hormone causes a thickening of the vaginal epithelium, it has proved to be of definite value in the treatment of chronic gonococcal vaginitis in children.

Hormones of the Gastro-intestinal Tract

At least three hormones are now known to be elaborated by the mucosa of the upper part of the small intestine. The first of these to be discovered was called *secretin* by its discoverers, Bayliss and Starling, because it stimulates the pancreas to secrete digestive enzymes. While the physiological role of this hormone is extremely important, no clinical use has as yet been made of the chemically purified principle. A substance chemically allied to secretin and produced in the same region of the intestine cause prolonged contraction and emptying of the gall-bladder after each meal. Whether or not this hormone, *cholecystokinin*, but recently discovered by Ivy, will find a practical use in the diagnosis or treatment of gall-bladder disease cannot be predicted at present. No pathological condition has as yet been identified with its deficiency or overactivity. The third hormone of the intestine, *enterogastrone*, has recently been shown by its Chinese discoverers, Lim and coworkers, to inhibit the secretion and the motor activity of the stomach in lower animals. When it has been sufficiently purified for use in man, this interesting substance may find an important place in the treatment of stomach and duodenal ulcers.

Through the pioneer experimental studies of Whipple and Robbins and the clinical investigations of Minot and Murphy has come one of the most important medical discoveries of modern times. This was that the liver contains a substance capable of stimulating blood regeneration and of transforming victims of the previously fatal disease, pernicious anemia, from a state of invalidism to one of vigorous health within a comparatively short time. Ingenious experiments subsequently carried out by Castle and by Sturgis and Isaacs have shown the *antipernicious anemia factor* to be present also in the wall of the lower end of the stomach. Some workers now believe that it is elaborated entirely by the stomach, the liver merely acting as a storehouse for the finished product. At any rate, it has been isolated from both sources and is now commercially available in sufficiently pure form for parenteral administration. A weekly or biweekly injection suffices to maintain the patient with pernicious anemia in a state of excellent health. The exact chemical nature of the active principle has not as yet been determined.

In conclusion, it must be emphasized that this more or less cycloramic presentation of the extensive field of endocrine physiology and pathology omits many important details. For example, such newly discovered substances as *sympathin* (Cannon), which is released from the tissues as a result of sympathetic nervous stimulation, and an acetylcholine-like body set free in connection with vagus activity, have not been discussed. Another intriguing new phase of endocrine physiology, that concern-in the *antihormones* discovered in the blood serum by Collip and his co-workers, has also been omitted for lack of space. Enough has been said, however, to indicate the transcendent importance of the principle of chemical regulation in physiology and clinical medicine and to justify an expression of optimism for the future. Nevertheless, it is obvious that much still remains to be learned. The task of determining the exact chemical structures of the known active principles is no more than one-fourth finished. There are undoubtedly additional hormones to be discovered. If the brilliant achievements of the past decade are to be equaled or surpassed during the next ten years, therefore, we may look confidently to the future for developments, which will revolutionize certain fields of medical practice and enrich every branch of biological science.

Tuberculous Meningitis in Children*

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THE IMPORTANCE of tuberculosis and its tragic consequences are seen in children most strikingly in tuberculous meningitis. It is second in frequency in most reported series only to meningococcus meningitis. At the Babies Hospital in New York City, excluding meningococcus meningitis, 70% of all acute cases of meningitis were found to be tuberculous.[9] Blacklock[4] of the Royal Hospital for Sick Children at Glasgow reports 396 cases of meningitis, 232 or 58.6% of which were tuberculous. Figures from the Minnesota Department of Health for the period 1928-1934 show a total of 1,235 cases of all kinds of meningitis. Of these, 50% were meningococcus meningitis and 29% tuberculous meningitis. At the University of Minnesota Hospitals there have been nine proven cases in children of tuberculous meningitis in the seven-year period since 1928.

The peak of the disease occurs at the age of one year. Four of the nine cases reported in this study (Table 2) were one year of age, whereas the remaining were scattered throughout the pediatric age group. Hillyard Holmes[8] reported 29 cases in adults and found the average age in his adult series to be 26 years.

Pathogenesis and Pathology

Formerly it was believed that tuberculous meningitis was due to a hematogenous dissemination of bacilli. Recent work by Rich and McCordock[13] points to a primary location of tubercles in the brain, meninges or contiguous structures, which later become caseous and rupture into the meningeal space and cause a tuberculous meningitis. They reported 82 cases; in 77% an older focus was found in one of the aforementioned locations. They point out that meningitis may be absent in miliary tuberculosis; that tubercles in the viscera and meninges may be in different stages of development; that meningitis may occur without miliary tuberculosis elsewhere; and that the meninges are tissues (as are the pancreas and the thyroid glands) not usually infected by way of the blood stream. The meninges are difficult to infect by massive doses of tubercle bacilli in the blood stream but can be infected easily by the intrathecal administration. In confirmation of their work, MacGregor, Kirkpatrick and Craig[14] report finding older parent foci in the brain, meninges or bone in 25 of their 27 cases of tuberculous meningitis.

Briefly, the pathology of this condition as stated by Rich and McCordock[13] is characterized by its exudative inflammatory nature and a tendency to wide spread necrosis of the inflammatory exudate and of contiguous meningeal tissues.

Symptomatology

The onset is usually insidious with irritability and drowsiness being the predominate initial symptoms; headache is marked in older patients. Stiffness of the neck and extremities follows together with vomiting which in turn may lead to dehydration. Also, hyperesthesia is often present. In the later stages, twitchings, transient paralysis, or actual convulsions may appear. The pupils may not respond to light and in terminal stages of the disease, the ophthalmoscopic examination may reveal choked discs or tubercles in the choroid. The length of illness from the time of onset to termination is usually three weeks. The temperature throughout is usually not above 101° F. but may rise to higher levels as death approaches.

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Differential Diagnosis

The final diagnosis depends on finding the tubercle bacilli in the spinal fluid either by direct means or by guinea pig inoculation. The characteristics of the chemical and cellular variations of the spinal fluid in tuberculous meningitis are outlined and contrasted with other meningoencephalopathies in the accompanying Table 1 prepared by Lyttle[11].

It is to be emphasized that characteristically the sugar and chloride of the spinal fluid are simultaneously lowered in tuberculous meningitis. The spinal fluid sugar, however, may be normal absolutely, but low relative to the blood sugar, the latter being frequently elevated in this disease.

By the ordinary methods, the tubercle bacilli are found only rarely on direct examination of the spinal fluid. In the nine proven cases reviewed by us, the organism was found in only two. The guinea pig inoculation was positive in two additional instances. When special methods are used, the organism can be recovered in over 90% of the cases. Hemenway[7] advocates the collection of 40 cc. to 60 cc. of fluid when possible, incubation for 10 hours and examination of the web, or examination of the sediment following the centrifuging of the large amount for one hour at high speed. Superimposition of the drops of sediment, allowing each drop to dry, followed by the microscopic examination of the stained material is also advocated by Hemenway.

Recently, a disease has been described called Benign Lymphocytic Choriomeningitis.[1, 2, 3, 15] It has many of the same characteristics early in the course and may easily be confused with tuberculous meningitis. The spinal fluid sugar and chloride, however, in this disease are repeatedly normal, and the outcome is favorable. The diagnosis of Benign Lymphocytic Choriomeningitis is confirmed from the blood of recovered patients which protects mice against Armstrong's virus.

Treatment and Prognosis

The treatment of tuberculous meningitis is usually considered to be symptomatic only, consisting of frequent spinal drainage and tube feeding when necessary. Wallgren[16] states that rigorous treatment of the primary complex will lessen the incidence of meningitis. The prognosis is considered to be uniformly fatal. However, Cramer and Bickel[6] as reported by Clark[5] found 45 cases in the literature, proven to be tuberculous meningitis with recovery. Kelly[10] reports a case proven by guinea pig inoculation and by finding the organisms in the spinal fluid, which was well two and one-half years later but had residual spasticity and gross tremor of the upper arm. He was able to find 75 cases of recovered tuberculous meningitis which he regarded as authentic.

TABLE 1

Table illustrating the chemical and cellular variations in the meningoencephalopathies characterized by a clear spinal fluid

	Wassermann	Chlorides	Sugar	Protein	Cell Count
Meningismus convulsions	Negative	680-750 mg. Normal	40-100 mg. Normal or +	40-70 mg. Normal or +	Normal or up to 90 Lymphocytes
Epidemic encephalitis	Negative	680-750 mg. Normal	40-150 mg. Normal or +++	40-100 mg. Normal or ++	10-200 Lymphocytes
Lead encephalitis	Negative?	680-750 mg. Normal	40-100 mg. Normal or +	100-400 mg. ++ or ++++	10-60 Mononuclears
Anterior poliomyelitis	Negative	680-750 mg. Normal	40-100 mg. Normal or +	60-100 mg. + or ++	Normal or up to 2000 P.M.N.'s Lymph.'s 70-80%
Lues	++++	680-750 mg. Normal	40-60 mg. Normal	80-150 mg. + or+++	50-500 Mostly Lymph.'s 5% P.M.N.'s
Brain tumor	Negative	750 mg. Normal	40-100 mg. Normal or +	40-70 mg. Normal or +	Normal or up to 50 Lymphocytes
Tuberculous meningitis	Negative	500-650 mg. Low	0-40 mg. Low	100-400 mg. ++ to ++++	Rarely 50% P.M.N.'s 80-1000 Lymph.'s

Table 2

Table illustrating coexistence of meningitis with intrathoracic lesions deemed representative of tuberculosis of first infection

Case No.	Age	History of Contact	Chest X-ray	Postmortem Examination				Bacilli found in	
				Lung	Extra-Pulmonary	Miliary	Meninges	Guinea Pig	Spinal Fluid
631927	7	Mother	Calcified Gohn Mediastinal nodes	Ghon	Negative	Liver Kidney	+	+	+
625388	3	Mother	Calcified Gohn	Negative	Negative	Negative	+		
48771	1	None	Primary Pneumonic Infiltration, Enlarged Mediastinal nodes	Tuberculous Pneumonia Caseous hilus nodes	Kidney Bladder Peritoneum Lymph nodes	Spleen	+		
64038	1	Family 3 members	Primary Pneumonic Infiltration	Tubercles with consolidation	Negative	Negative	+		
628842	5	Mother	Primary Pneumonic Infiltration	Fibrosis	Tuberculous Otitis Media	Liver Spleen	+		
58452	15	Not taken	Generalized miliary tuberculosis with coalescence	Miliary involvement Mediastinal nodes	Negative	Kidney Spleen	+	+	
53552	1	Not taken	Enlarged Mediastinal nodes	No Postmortem Examination					+
622024	10	Grandfather Neighbors	Enlarged Mediastinal nodes	Head only					
640248	1	None	None	No Postmortem Examination				+	

Discussion

From the study of our nine cases (Table 2) treated in the University of Minnesota Hospital, it seemed obvious that the significance of prevention in this disease is all important. Five of the nine cases gave a history of contact in the home. Two of the cases gave no history of known contact, while in two others there was no record of the family history. In cases where no history of contact is available, it has been found helpful to check the Mantoux and chest X-ray of the immediate family.

Prevention is contingent upon avoidance of contact with active disease. Only by the early discovery of cases of active tuberculosis with germ-laden sputum is it possible to prevent tuberculous meningitis. It must be added that the bovine source of contact must continue to be combatted by the routine testing of cattle. A significant point relative to prevention, as brought out by McCracken[12] is the fact that the death rate from tuberculous meningitis is falling in proportion to the decline in the death rate from other forms of tuberculosis.

Further, from the nine cases it was revealed that in seven cases there was X-ray evidence of some form of pulmonary tuberculosis. In one case the X-ray of the chest revealed only increased markings, and in one case there was no X-ray examination. Definite evidence of calcification in the first two cases was demonstrated by the X-ray or postmortem examination, and Cases 3, 4 and 5 seemed to be in the pneumonic stage of the primary infection. Case 5 also showed evidence of miliary liver and spleen involvement as well as miliary tubercles in the meninges. This seems to point to the fact that tuberculous meningitis may complicate tuberculosis of first infection, in both the calcified as well as the fresh pneumonic stages of development. In no case was there any pathology to indicate that the patient was suffering from phthisis.

Rich and McCordock maintain that the primary lesion must first occur, following which there is dissemination of the bacilli, which in turn produces tubercles in or near the meninges. The breakdown of these intracranial foci produce tuberculous meningitis. This train of events would seem to be contrary to the occurrence of meningitis concomitant with early primary tuberculosis.

MacGregor, Kirkpatrick and Craig[14] state that in children meningitis "often causes death at a time when the initial infection has not progressed beyond the stage at which it presents the typical characters of the primary complex, and the most advanced lesions in the body are readily identified." The above workers observed several cases in which death occurred while the meningitis was at a very early stage. In each case they found an older caseous mass in the brain substance or in the meninges, from which the exudative meningitis had quite obviously taken origin. They state that, "These cases afford very strong evidence in favor of Rich's view."

Wallgren[16] states that "tuberculous meningitis develops as a complication to fresh primary tuberculosis. As soon as encapsulation and calcification begin the risk of meningitis is greatly diminished." To support this view he cites 166 cases, 82.66% of which showed fresh anatomic changes at necropsy. Later in his paper he plots the curves of primary tuberculosis and meningitis, showing that the peaks of the former antedate the latter by three to four months. This evidence seems to point to the fact that meningitis does not occur coincident with the initial infection, but foci laid down at the time of the primary infection, may cause tuberculous meningitis at any stage. The greatest incidence occurs, however, shortly after the primary infection, being a matter of only a few months.

Conclusion

It is impossible to draw any conclusions from our limited study of this brief series, but it seems logical to suggest that lesions laid down at the time of the primary infection in the meninges or brain, forming a component unit of the primary complex, may be the parent to the meningitis at any stage. Lesions of tuberculosis which were demonstrated elsewhere at the time of the meningitis were those of the first infection. We have tried to present the most recently published concepts in the field of tuberculous meningitis.

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Influenzal Meningitis*

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THAT meningitis could be caused by the influenza bacillus (Hemophilus influenzae) has been known since 1899 when Pfeiffer identified the organism definitely in the spinal fluid of a case reported by Slawyk.[1] Except for case reports, no further studies were made until 1911 when Wollstein[2] made careful analyses, including virulence tests, of the spinal fluids in eight cases. She stated, "It remains, however, for the present an undecided question whether influenza bacilli may not occur in the cerebrospinal fluid without setting up inflammation just as pneumococci and some other organisms have been known to do." She succeeded in establishing the virulence of her human strains by producing fatal meningitis in monkeys. In 1921 Neal[3] reported 32 cases with one recovery. Rivers[4] reported 23 cases with one recovery, and a complete review of the literature up to 1922 in which 220 cases with 17 recoveries were included. His studies led him to believe that the disease is most often a primary one, produced by meningitis strains of influenzal bacilli closely allied to one another and differing from ordinary respiratory strains.

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Incidence of the Disease

When individuals of all ages are considered, influenzal meningitis ranks fourth among the types of purulent meningitis. Recent reports of bacterial meningitis by Neal[3] and Tripoli[5] from New York City and New Orleans respectively reveal an almost identical relative incidence (table 1).

TABLE 1
DISTRIBUTION OF MOST COMMON FORMS OF MENINGITIS (ALL AGES)

Form	No. of Cases (Neal)	No. of Cases (Tripoli)
Meningococci meningitis	1216	221
Tuberculous meningitis	961	51
Pneumococcic meningitis	209	111
Streptococcic meningitis	203	24
Influenza bacillus meningitis	111	20
Staphylococcic meningitis	27	9

Recent studies have indicated that this form of meningitis is essentially a disease of infancy and early childhood. Ward and Fothergill,[6] studying the relative frequency of the various types of meningitis in 184 children under two years of age from 1926 to 1931 at Children's Hospital, Boston, found B influenza second only to meningococcus as the infections agent in the non-tuberculous cases (table 2). This high incidence in young children is confirmed by the records of the Children's Hospital of Philadelphia in which 11 per cent of all meningitis under two years was caused by B influenza. Rivers found 79 per cent of the 220 cases which he collected were under two years of age and Neal reported that 84 per cent were under five years.

TABLE 2
RELATION OF AGE TO INCIDENCE OF INFLUENZAL MENINGITIS

Organism Causing Meningitis	No. of Cases	Percentage of Total
B. Tuberculosis	60	32.6
Meningococcus	56	30.4
B. Influenza	25	13.5
Pneumococcus	23	12.5
Streptococcus	14	7.5
Other types	6	3.5

An explanation of their age incidence of 80 per cent between two months and two years is offered by Fothergill and Wright.[7] The bactericidal power of blood from the umbilical cord and of infants during the first six weeks of life, for the meningitic strains of the influenza bacillus, they found to be considerable. They believe that this represents passively acquired immunity from the mother. With rare exceptions the blood of children between two months and three years has practically no bactericidal power, while after this age there is a gradual increase which appears to be permanent in adult life. This, they believe, represents an acquired active immunity.

These high incidence rates are in distinct contrast to the infrequency with which the diagnosis of influenzal meningitis occurs in the records of local hospitals. In the records of the three largest general hospitals only 10 cases have been recorded since 1928, most of them occurring in the last two years.

Although the explanation for the seemingly low incidence rate is not known, Rivers suggests that "While the bacilli are easily demonstrated in direct smears or in cultures by one accustomed to working with them, they may be overlooked by one less experienced. Consequently, some cases of influenzal meningitis may be treated as meningococcus infections in which no organisms were seen or grown and tabulated as deaths from epidemic cerebrospinal meningitis." In addition, there is the strong possibility that, because of the bizarre appearance of the long curved filamentous forms frequently present, contamination is suspected and the fluid discarded. A third reason is that only peptone, in which B. Influenzae does not grow well, rather than blood agar, is sometimes used for the spinal fluid cultures.

Spinal Fluid Examination

The spinal fluid does not differ in appearance from that of other forms of purulent meningitis. It is cloudy to purulent in appearance, shows marked pleocytosis with a predominance of polymorphonuclears, an increased protein and a low sugar content. The number of bacilli present is usually large and differs from the type originally described by Pfeiffer (i.e., short rod with rounded ends; so short as to be almost coccal) in that there is frequently a large number of long, thin, wavy or curved, threadlike forms sometimes lying together in tangled masses and resembling the leptothrix group in morphology. Wollstein noted that this pleomorphism increased with age of the culture.

B. Influenzae grow best on rabbit's blood agar, appear as minute dewdrop-like colonies and are likely to be overlooked. If influenza bacilli are seen in the smear, or if no organisms are found, an indol test should be done, using Ehrlich's reagent. Rivers and others have shown that most meningitic strains produce indol. If the indol test is negative, another tube of spinal fluid should be placed in an incubator over night, preferably though not necessarily, with a few drops of citrated rabbit's blood added to it. After 18 hours at 37°C. make a Gram-stained smear and repeat the indol test. A positive indol test is pathognomonic while a negative test does not exclude the presence of B. Influenzae.

Etiology

A great deal of discussion has arisen as to whether influenzal meningitis is a primary or secondary disease. Many older writers consider it a complication of a respiratory infection. The largest number of cases occur in the last half of the year coinciding with the peak of the curve of pneumonia incidence. In New York City, there was *no* increase in the number of cases during the influenza epidemic in 1918 and 1919. In a comprehensive study of meningitis secondary to otitic or sinus infection, Neal, Jackson and Applebaum[8] list the conditions regarded as primary or as possible predisposing factors in the more common forms of purulent meningitis (table 3).

TABLE 3
MENINGITIS—PRIMARY FACTORS

Form	Streptococcus	Pneumococcus	B. Influenzae
Otitis Media, Mastoiditis and sinusitis	121	75	20–
Pneumonia before onset	1	27	15
Upper respiratory infection	8	12	4
Pneumonia during meningitis	3	17	11
Injury to head and skull	8	8	4
Operation on nose and throat	3	4	–
Bacterial endocarditis	4	–	–
Brain Abscess	1	1	–
Wounds—Abscesses—Furunculosis	7	2	4
General lowered resistance	14	11	10
Trauma other than to head	–	5	2
No evidence of primary infection	33	50	48
No history	2	2	
Total	205	214	118

It is evident from an examination of this table that respiratory infections are much more commonly precursors of pneumococcic and influenzal meningitis than of the streptococcic form. The large number in each type where no evidence of primary infection was noted is of doubtful significance since the evidences of primary infection may have subsided before the onset of meningitis or may be so slight that they escaped observation.

Rivers states that 74 per cent of the cases studied by him were probably primary infections. He found that 15 meningitic strains could be divided into four groups, by absorption tests, and that none of 18 respiratory strains was indentical with these groups. Povitzky[9] found that over 50 per cent of the strains of influenzal meningitis fell into one group by agglutinin absorption tests in contrast to the multiplicity of respiratory strains. Pittman,[10] by means of cross precipitation and direct agglutination reactions, found that all but 4 of 41 meningeal strains fell into one group, all were smooth (S) strains, contained capsules and produced a specific soluble substance.

Clinical Picture

This differs in no way from that of meningococcic meningitis; a hemorrhagic rash may even be present which is supposed to be characteristic of the latter disease. The earliest signs are usually irregular fever, irritability and gastro-intestinal disturbance. The diagnosis is frequently difficult because so large a percentage of cases occurs in the age (infancy) when symptoms are not referable to the nervous system. It is most often mistaken for pneumonia because of the unexplained fever associated with rapid, difficult, embarrassed respirations. The leucocyte count is increased—11 to 76,000 cells with an increase in percentage of polymorphonuclear cells (70-80 per cent) which is in striking contrast to epidemic influenza.

Report of a Case of Influenzal Meningitis

A white female, 23½ months of age, admitted 7-10-35 and expired 8-3-35 (24 days).

Upper Respiratory Infection

7-9-35—Appeared irritable in morning. Face flushed and temperature 102.6° R. in afternoon. Vomited in evening. Physician called. Throat reddened and left ear slightly injected. Given sponge baths and throat irrigations. During night, breathing became more difficult.

Severe Toxicity

7-10-35—8 a.m.—Temperature 100.6. During morning, played about in bed but vomited. 8 p.m. —Child stuporous and pale. 8:30 p.m.—Admitted to hospital. Physical Examination showed generalized inflammation of throat without membrane. Breath sounds replaced by laryngeal stridor; no râles. Ears, abdomen and extremities—negative. No neck rigidity. Kernig sign negative. Laboratory: Blood, white blood cells 3,500, polymorphonuclears 92 per cent. Chest plate—no areas of density. Laryngoscopic examination—some exudate over arytenoids and glottis but no obstruction. Cyanosis of moderate degree. Given steam inhalations in oxygen tent. Given 150 cc. citrated blood, 500 cc. saline, and glucose. Temperature 103.6. Respirations 70. Pulse 160. Some diminution of breath sounds suggesting atelectasis of lungs. White blood count shows rise to 12,000 with 90 per cent polymorphonuclears. 7-12-35—Difficulty in breathing subsiding. Urine —1 to 2+ albumin, occasional white blood cells.

Meningeal Signs

7-13-35—Drowsy. Elevated temperature continues. Kernig sign negative. Pupils moderately contracted. Lumbar puncture done: cell count 840, 74 per cent polymorphonuclears; smear shows no organisms; cultures made. 11 p.m.—Still stuporous. Neck rigidity 2+. Temperature 101.8. Spinal puncture repeated—cell count 180 cmm; smears negative for organisms in Gram-stained centrifuged smear.

Onset of Pyelitis

7-14-35—Temperature 102. Meningeal signs decreased. Spinal fluid cultures sterile. Chest clear. Urine (centrifuged)—large numbers of white blood cells. Fever still persists in latter part of day. 7-16-35—Temperature 103. Urine culture—coli and streptococci, sediment loaded with white blood cells.

Improving

7-17-35—Neck rigidity present but less marked. More alert. Spinal puncture—pressure 240 mm. of water, smears and cultures negative. Urine—large numbers of white blood cells and bacteria. 7-18-35—Temperature 103. Chest clear. 7-22-35—Temperature 103. Urine—pus and bacteria present.

Cystoscopy

7-24-35—Negative cystogram. Cystoscopy—moderately dilated kidney pelves and ureters. 7-26-35—Temperature rising somewhat higher, reaching 104. 7-27-35—Urine—fewer white blood cells.

Relapse: H. Influenzi in Spinal Fluid.

7-29-35—Increased neck rigidity. Pressure—100 mm. water; fluid cloudy; cell count 350, 90 per cent polymorphonuclears; direct smear—loaded with gram negative pleomorphic organisms of coccoid and long filamentous forms as well as small rods. Appearance is characteristic of hemophilus influenzi. 7-30-35—20 cc. anti-influenzal meningitis serum (obtained from Massachusett's Department of Public Health) given intrathecally with 6 cc. of complement after removal of 30 cc. of cloudy spinal fluid showing many influenzal organisms. This was repeated twice daily on 7-31-35, 8-1-35, and 8-2-35. After 7-31-35, the spinal fluid examination failed to reveal any organisms on direct smear or culture. The fever rose steadily and on 8-3-35 death occurred.

*Autopsy**

Body is well developed, well nourished, measures about 89 cm. in length and weighs approximately 15.4 kilograms. Peritoneal cavity is smooth and glistening; no excess fluid. Appendix hangs free. Purulent fluid: Right pleural cavity contains about 75 cc. slightly turbid fluid; left negative. Pericardial sac shows no change. Heart weighs 85 grams. Musculature is firm. Valves show no evidence of recent or old endocarditis. Root of aorta and coronaries are negative. Atelectasis: Lungs each weigh about 110 grams. Patchy lobular type of atelectasis about margin of left lung and along right lower lobe. Spleen shows no change. Toxicity: Liver weighs 550 grams and is mottled throughout with yellow markings of fatty change. Gall-bladder shows no change. Gastro-intestinal tract shows no ulcerations, inflammatory reaction or diverticulae. Pancreas is soft. No tumors or cysts. Adrenals are well formed. Pyelitis: Each kidney weighs 80 grams. Capsules strip easily. Kidney substance somewhat pale. Enlarged pelves. Mucosa edematous, reddened and thickened. Ureters dilated and mucosa likewise shows inflamed tissue. Ureters more injected than pelves of kidney proper. Genital organs—negative.

Meningitis, Localizing Abscesses

Head: Scalp and calvarium show no change. Meninges reddened throughout. Fluid very turbid. Over entire surface of brain, both vertex and base, there are localized collections of thick yellow pus. These patches are irregularly distributed. Largest collections over tips of both temporal lobes on ventral surface. Similar collections over convolutions of cerebellum. Base of brain is bathed in pus but there does not appear to be a localized collection such as is present in other areas. These collections of pus average about 4 x 3 cm. in diameter. Pus seems to be held in position by adhesion of pia against brain tissue. Over posterior poles of cerebellum when collection of pus is punctured and pus evacuated, there is a depression in the surface of the brain marking out the position of the collection. Over the pituitary, there is a nodule of firm organized pulp having a consistence suggesting old pus infiltrated with fibroblasts. The middle ears and mastoid opened on both sides. There is stringy mucus but no pus. The interior of the brain shows no change. There is congestion and dilation of the blood vessels. No abscesses within brain substance itself. Ventricles filled with turbid fluid and choroid is markedly congested.

Smears

Made at postmortem of various viscera. The following results are noted: Fluid from right pleural cavity shows mixture of organisms in which streptococci predominate. Spleen and lungs show no organisms. Kidney pelves again show heavy mixture among which very large gram negative rods, having morphology of proteus, predominate. Smears of collections of pus from over surface of brain show very scant number of same type of pleomorphic gram negative rods seen in spinal fluid.

Diagnosis

1. Influenzal meningitis. 2. Pulmonary atelectasis. 3 Pleurisy. 4 Bilateral Pyelitis. 5. Ureteritis.

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*Autopsy and bacteriological examinations were conducted under the direction of Dr. Rudolph Kouchy—University Hospital Pathologist.

Pathology

The picture is usually one of massive purulent meningitis as described in the case report. In protracted cases, diffuse involvement of the cerebral parenchyma may occur with hemorrhages and abscesses. Organization of the pus at the base of the brain with formation of fibrous strands in the meninges also characterizes the cases of longer duration.

Course of the Disease and Mortality

Although a short fulminating course is occasionally observed, the disease is usually protracted. In Neal's series, the duration of the majority of cases was between 10 and 20 days. In Rivers' 22 cases, the average length of life was 20 days. Thirteen of Neal's 111 cases lived 30 to 60 days longer but only 4 recovered—a mortality of 96.4 per cent. In Rivers' collection of 220 cases, 1922, 17 recovered—a mortality of 92 per cent. Bloom[11] in 1931 made a complete survey of the literature, adding 82 new cases to Rivers' collection of 220—with a total of 24 recoveries—a mortality rate of 92 per cent. Thirty-eight was the total number of reported recoveries up to 1934; three more were reported in 1935: and in the March, 1936, issue of the American Journal of Diseases of Children, Spekter,[12] Durham, N. C., reports the recovery of a six-year old boy following the use of specific antiserum from the Massachusetts Department of Public Health.

Treatment

The first serum for the treatment of influenzal meningitis was developed by Wollstein[13] who immunized goats and was able to prevent death in two monkeys given influenzal bacilli intrathecally. The same serum was used in two recoveries reported by Torrey[14] and in five cases by Neal with no recoveries. The Department of Health research laboratories, New York City, has prepared anti-influenza serum since 1920 by immunizing horses with strains of the influenza bacillus found by Povitzky to predominate in their cases of influenzal meningitis.

In 1932, Ward and Wright[15] found that complement was absent in the spinal fluid of influenzal meningitis patients and recommended the addition of normal serum to anti-influenzal serum before injection. They found that this produced a temporary disappearance of organisms from the spinal fluid in 8 cases all but one of which, however, died and at autopsy showed abscesses walled off from the general subarachnoid space.

Pittman in 1933 developed a type-specific H. Influenza antiserum using a predominating strain with which 37 out of 40 strains agreed. She found, experimentally, that the dosage of the culture could not be too large or the serum would not completely protect no matter how large the amount given. Employing the serum in a series of 18 patients with influenzal meningitis, recovery occurred in one. In 2 others, although the patients ultimately died, the spinal fluid cultures, after treatment with serum, became sterile. An effort to produce a more potent specific serum is suggested by this work.

Some patients at autopsy show the meningitis practically subsided, but severe toxic changes in many of the viscera indicate the advisability of intravenous as well as intraspinal administration of serum.

Kubie[16] has discussed the method and underlying principles of forced drainage of the cerebrospinal fluid, using hypotonic intravenous saline and lumbar drainage, in influenzal meningitis. Neal has reported apparent benefit from its use, but in some cases necropsy showed an extensive edema at the base of the brain. This serves to emphasize the danger of this method because of the difficulty in excluding the chief contra-indication for its use; namely, a block in the aqueduct or the basal cisterns.

Tripoli[5] in a recent review of 468 cases of meningitis at New Orleans Charity Hospital suggests a new method for the administration of anti-sera based on Danna's principle of air replacement. With the patient in a sitting position, spinal fluid is withdrawn in 10 cc. quantities which is then replaced with air until all of the cerebrospinal fluid has been removed. The buttocks of the patient may then be elevated and the air replaced by serum. It would seem that this would allow the administration of more antiserum at one time than any other method.

Most of the recoveries to date have followed the use of simple lumbar drainage and the use of specific antiserum. In view of the demonstrated lack of complement in the spinal fluid of cases of influenzal meningitis it would also seem adivsable to use adult, or better, convalescent serum with the antiserum. Because of the frequent associated septicemia, blood transfusion should be a valuable adjunct to the specific treatment. Specific antiserum has now been prepared under the direction of Dr. Dorothy Weiss of Washington University, St. Louis, H. K. Ward of Harvard, Margaret Pittman at Rockefeller Institute and O. R. Povitzky at the research laboratory in New York City.

Summary

1. Influenzal meningitis, occurring chiefly in infancy and early childhood, is produced by strains of influenzal bacilli closely allied to one another and differing from respiratory strains, culturally and serologically.

2. Its low incidence in this region compared with its frequency in other areas indicates that it occurs much oftener than it is diagnosed.

3. The diagnosis is often overlooked because of:

(a) Bizarre pleomorphism of the bacilli.
(b) Using inadequate media for growth.
(c) Failure to utilize corroborative tests.

4. The primary character of the disease is not fully established.

5. A positive blood culture is often found.

6. Massive purulent meningitis, a protracted course and a high mortality are the chief features of the clinical picture.

7. A serum with higher antitoxic and antibacterial properties is needed.

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The Use of Calcium in the Control of Convulsions in Infancy and Childhood*

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IT IS my purpose to discuss the use of calcium in the prevention and cure of convulsions in infancy and childhood. Much of the theoretical, and perhaps even the empirical, will be utilized and incorporated into the arguments presented. This is done wittingly and with purpose, for one reason among others, that it has been so strictly left out of the usual discussions of the subject.

I am taking as a major premise the position that it is in the knowledge of the disturbances of cellular physiology that the greatest progress is to be made in the control of the convulsion. An old pathological classification divides seizures into organic and inorganic, the former indicating that there is present in the brain some specific lesion that is responsible and in the latter that such lesion is lacking. While such a classification may be of value to the pathologist it dwindles in importance to the clinician because not only is it frequently impossible to differentiate the two on clinical grounds but also it is apparent that cases originally belonging to the functional class may later develop organic lesions as a result of the convulsions themselves.

The more recent clinical classifications are scarcely more valuable when considered from this angle. Thus Peterman[1] in a study of 500 cases of convulsions in infancy and childhood summarizes the causes as epilepsy in 33 per cent, onset of acute infection 22.8 per cent, cerebral birth injury or residue 15.4 per cent, spasmophilia 13.6 per cent, miscellaneous causes 8.8 per cent, and unknown 6.4 per cent. Brown[2] in his study of 400 cases up to the age of two years uses a similar type of classification, his listing of causes including such conditions as acute infections, acute gastro-intestinal disease, acute central nervous system disorder, infantile tetany, cerebral birth injury, cerebral hemorrhage, cerebral deficiency, epilepsy, etc. While such studies have great value in our understanding of the variety of conditions in which convulsions are prone to occur they offer little that is of help in the understanding and prevention of the convulsive seizures themselves except in so far as they tell us to avoid this list of contributing causes. Obviously acute infection does not cause convulsions or almost all children would have them at one time or another. They can act only as precipitating causes in individuals otherwise predisposed. The predisposition is the important thing and only thru a more exact knowledge of this factor can we hope to make substantial progress in the prevention and cure of the convulsion.

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Unquestionably most of the modern writers have this viewpoint even tho they may not have approached the problem from this angle. Lennox[3] particularly has laid emphasis upon the predisposition to convulsions in his paper stressing the multiplicity of factors capable of precipitating seizures in any individual subject to them. He likens the convulsion to the overflow of a cistern when the influx of water is sufficiently great to raise the level above that of the retaining walls. In his illustration the cistern represents the total of factors (predisposition and stimuli) tending to give rise to the nervous explosion seen in the convulsion while the retaining walls are composed of those elements which tend to hold the explosion in check. The seizure may arise either as a result of the high level of the convulsive elements or because of the low level of the inhibitory factors.

Regardless of the variety of clinical conditions in which convulsions are encountered the essential symptomatology of all seizures is so like in character as to suggest with stubborn insistence that the underlying disturbance in cerebro-cellular function is similar, or essentially similar, in all. To be true there are certain general differences in types which involve perhaps the events leading up to or away from the actual attack more specifically than they do the convulsion itself and these have led to attempts to differentiate on this basis. However, the demarcations are not sufficiently reliable for application to individual cases and such a consideration leaves us not only barren of the accurate knowledge necessary for specific diagnosis but also totally ignorant of the pathological physiology involved. This knowledge is to become necessary for the effective control of convulsions regardless of the conditions under which they are encountered. It entails a minute acquaintance with processes which, being essentially chemical in nature, take place perhaps in accordance with definite laws which when they are known may become amenable to artificially induced conditions.

The most detailed knowledge of these chemical processes pertains to essential or idiopathic epilepsy. Most of the convulsions met with in later childhood are said to be of this type. McQuarrie,[4] with his associates, has done a monumental work in this field. He finds that the seizure is directly associated with tremendous changes in the metabolism of water, blood lipids, and certain inorganic elements particularly sodium and potassium. Factors tending to promote the retention of water in the body such as large water intake, alkalosis, etc., are conducive to convulsions whereas the induction of dehydration tends toward their control. Thus such empirical procedures as the anciently employed starvation and the later use of the ketogenic diet assume a scientific importance in their effects upon fluid retention. McQuarrie feels that the predisposition to the convulsive state lies in some abnormality of the brain cell membrane in its relation to these substances.

Next in importance to epilepsy as a general cause of convulsions throughout childhood, and more important throughout early life, is that of tetany or spasmophilia. This is thought by many to be the real cause of most of the convulsions seen in connection with acute infections. Besides the convulsion, which is the most active manifestation of tetany, a variety of other characteristics exist such as a heightened irritability of the peripheral nerves as shown by an increased electrical (Erb's sign) and mechanical (Chvostek's and Trousseau's signs) excitability, a tendency to muscle spasm (carpo-pedal spasm, laryngospasm, etc.) and certain irregularities of autonomic function such as sweating, irritability of the gastro-intestinal tract, nervous pallor, emotional instability, cold hands and feet, etc. Subcutaneous edema of mild to severe degree may also be present.

Tetany may occur at any age from birth on. It has been considered to be most common during the period from a few months to three years of age at which time it is called infantile tetany. Occurring at later ages it is called juvenile tetany, a disease which is not the rare phenomenon that it is considered to be. Until only recently the new born period was thought to be exempt but now tetany is known to occur frequently at this period of life and to be responsible for convulsions in the new born.[5] It is more common in boys than in girls. It exists in both a latent and an active form and is often brought to light by such adverse conditions as a sudden acute infection, a prolonged illness, lack of sunlight, etc.

Considerable is known concerning the chemistry of this condition although this knowledge pertains more to the chemical conditions that lead up to it than to the convulsion itself. It is generally considered to arise from a lack of sufficient ionized calcium in the blood and tissues.

The ionized calcium is a small and not definitely known fraction of the total calcium present in the blood. It may be diminished in the presence of either a normal or decreased total calcium level. Conditions under which it is encountered in combination with low total calcium are calcium starvation, lack of vitamin D or ultraviolet light, and hypoparathyroidism. In the following circumstances it may occur in the presence of a normal total calcium; excess of sodium or potassium, possibly in magnesium deficiency, guanidin intoxication and alkalosis. Experimentally at least an increase in blood phosphates may produce this effect also.

Calcium starvation is not so remote as might at first appear in view of the fact that the average American diet has been said to be insufficient in this element for metabolic equilibrium.[6] Deficits of vitamin D and sunlight are very common in any but the southern climates. It is this fact that accounts in part for the seasonal character of tetany, the peak arriving during the late winter and spring. Such tetany is often an associate of rickets. Hypoparathyroidism is more common than is generally supposed. It is inherited and familial in character. It is thought by many to be the underlying factor in the low calcium forms of infantile, new born and juvenile tetany. It is activated by such adverse conditions as acute infections and prolonged diseases. The seasons (ultraviolet ray) and diet (calcium intake as well as vitamin D) are profoundly effective in lessening or aggravating a parathyroid deficiency as the case may be. Besides a low total calcium this condition is characterized by a high phosphorous content of the blood.

Sodium or potassium excess is perhaps most important from an experimental standpoint though in certain clinical forms of tetany the possible co-operation of this factor is suggested. I know of no direct evidence that magnesium deficiency might be responsible for tetany but it is known to produce nervous symptoms to mild character that are indistinguishable from those of calcium deficiency.[7] Added interest attaches to the fact that magnesium is so effective in controlling some of the convulsions of tetany. Guanidin intoxication is a common occurrence in high fevers, dehydration, and gastro-intestinal diseases and may be the cause of acute tetanic symptoms according to Dodd and Minot.[8] Alkalosis is the most commonly recognized cause of low ionic calcium and tetany in the presence of a normal calcium level. It may result from an excessive intake of alkali such as in the treatment of gastric ulcer or from sodium bicarbonate administration in vomiting, from the vomiting of acid gastric contents, and from the loss of carbon dioxide in hyperventilation. The latter may occur unconsciously as in the presence of fever, excessive crying or mild anoxemia, or it may be accomplished purposefully as in experimental tetany and in certain hysterical subjects. It has been known to occur as a sequel to encephalitis. Individual sensitiveness to the effects of hyperventilation varies greatly. This factor is very important in certain of the tetanies of the new born and infantile periods at least.[9]

The variety of clinical conditions that are capable of ending up with an active tetany through the mechanisms described offers a very wide base from which events may pyramid themselves through the medium of calcium deficiency toward the apical point represented by the convulsion. Such a conception disorganizes many of the classifications of convulsions that have been offered in that it encompasses many of their subdivisions. Especially is this true in convulsions accompanying acute infections and disturbances of the gastro-intestinal tract. Even a history of convulsions in relatives, *indeed a familial history of epilepsy* only intensifies the obligation in ruling out a calcium deficiency as a basis in any convulsive disorder during infancy and childhood. Tetany is distinctly a familial affair and a history of childhood convulsions in the parents of such children is very common. It seems to be a fact that occasionally, if such convulsions are often repeated, a convulsive habit may be set up which is capable of carrying on into true epilepsy after the original cause can no longer be demonstrated. Hence true epilepsy may be uncovered in the history of such cases.

What shall we consider to be sufficient evidence that calcium deficiency can be ruled out as a cause of convulsions in infancy and childhood? Certainly not the fact that the blood calcium values are normal, although a low blood calcium would usually be very suggestive evidence that this factor were important. Until our knowledge of all factors is more complete the only method of ruling out calcium deficiency will be by therapeutic test.

Even in proven idiopathic epilepsy there is good reason for employing active calcium therapy as a possible adjunct in treatment. McQuarrie has shown that two of the important disturbances of function in these cases are a tendency to fluid retention and an increased permeability of the cell membranes. Calcium deficiency is known to produce both of these conditions. Alkalosis, conducive to convulsions in the epileptic, is also capable of producing convulsions in non-epileptics through its capacity for rendering calcium inactive. Finally sodium and potassium, elements that are so actively involved in the convulsive state in the epileptic, are antagonized in their irritating effects upon nervous tissue by calcium. Thus, without attributing too much value to the procedure, I am of the opinion that the administration of calcium has a definite field as an adjunct in the treatment of epilepsy.

Calcium therapy must be considered from two angles, the emergency when convulsions are either present or threatening and the interval between such incidents when the individual is apparently quite normal. Emergency treatment has as its purpose the immediate increase in the ionized calcium of the blood. It is best accomplished by the intravenous injection of calcium salts of which calcium chloride is the most effective. It has one great disadvantage for use in tiny infants in that it is very irritative if spilled outside the vein. Calcium gluconate is much safer if somewhat less potent. Both salts are obtainable in ampules of 10 per cent solution ready for injection and should be given slowly. They raise the calcium level very rapidly (from 80 to 100 per cent in five minutes according to Cantarow) and may thus accomplish results that seem little short of miraculous, as for example in status epilepticus. Because calcium introduced in this manner is rapidly eliminated it requires either frequent repitition or better the intramuscular injection of a suitable salt.

Calcium chloride can not be used for intramuscular injection but calcium gluconate is quite acceptable. Introduced in this manner its effects are much more lasting and it is thus wise to inject both intravenously and intramuscularly at the beginning. As many as 10 cc. are commonly given even to new born infants and may be repeated at daily intervals if it is found to be necessary.

The most valuable procedure in my hands has been the injection of parathyroid extract. It may be used in addition to the other two methods and, since its effects are slower, acts to prolong the effects that they accomplish. Cantarow says that the maximum rise in blood calcium occurs about six hours after injection. In addition to raising the calcium level parathyroid produces an early rise of blood magnesium, which may account in part for its occasionally striking early effects, and an increased ionization of the calcium present.

Just what is to constitute the proper dosage for any case can not be predicted in regard to any of these substances. This must be determined independently for each individual. The ideal control would be by frequent determinations of the blood calcium, the goal desired being the reaching and maintaining of higher normal levels up to 12 or 13 mg. per 100 cc. of serum. Most frequently such control will not be available and one must rely upon the response of the patient to determine the intensity of treatment. Intravenous injection should not be required a second time if one avails himself of the intramuscular route and parathyroid therapy. The latter presents the theoretical danger of producing a dangerous hypercalcemia if repeated at too frequent intervals though single injections need cause no apprehension. It may be repeated at intervals of four to eight hours as long as nervous irritability and threat of convulsions exists. It has been my custom to inject from ¾ to 1¼ cc. of parathyroid extract at a dose in new born infants and to repeat if necessary at the intervals suggested. In older infants and children it has seemed that results have been satisfactory if 1½ to 2.00 cc. are given in this manner.

Oral administration of calcium should be started as soon as the patient can co-operate. This may somewhat obviate the necessity for parenteral administration and gets him under way with the treatment that is to be continued into interval periods. Ultraviolet ray and vitamin D are not, in my opinion, valuable in the emergency though they are very important in the interval. Other useful measures concern the effort to increase calcium ionization in the body by decreasing the pH. They entail the giving of acid salts, starvation, ketogenic diet and carbon dioxide administration.

Of the acid salts the most efficient is calcium chloride which has the additional advantage of supplying calcium. It is not well tolerated by mouth, however, and is often vomited. More commonly used for this purpose, perhaps, is ammonium chloride but this salt may also be poorly taken by young patients. If used it is necessary to be cautious in order not to cause a dangerous acidosis. Starvation and the ketogenic diet produce the same effect and in addition cause fluid elimination which is favorable to the control of convulsions. The former is more adaptable to the acute disorders. One very important measure for the rapid induction of mild acidosis is the administration of carbon dioxide. This is especially adaptable to the new born and young infants when the patient may be easily placed in an atmosphere of 5 per cent carbon dioxide in oxygen. This procedure prevents hyperventilation with the resultant loss of carbon dioxide, a condition that is prone to occur in tetanic infants. The obvious corollary to these statements is a warning against giving alkalis. This is extremely important in view of the tendency to administer sodium bicarbonate to children on the least provocation.

It will be understood that these specific measures directed at increasing the calcium should be supplanted if necessary by the other well recognized measures used in the control of convulsions. These entail the giving of such drugs as the barbiturates, chloral, bromides, etc., and even the administration of chloroform.

Interval treatment has as its objective the maintenance of a normal or slightly high level of blood calcium. Calcium feeding plays a significant role. The most efficient salt is, here as in the injection, calcium chloride. Its irritative quality makes it difficult to use by mouth however and it is usually necessary to resort to less potent salts such as dicalcium phosphate, calcium gluconate and calcium lactate. Here again dosage is difficult to prescribe since it will vary according to age and individual peculiarities which only experience will accurately determine. I have usually given from ½ to 1 level teaspoon of the powder three times daily preferably at least one half hour before meals. Theoretically one is inclined to fear the production of an hypercalcemia in long continued administration and for this reason occasional blood calcium determinations are advisable. As a practical point, however, I have never yet been able to demonstrate any abnormal level of blood calcium by such means even after long time medication.

The giving of calcium salts by mouth may be without value if either vitamin D or ultraviolet ray are not also given. In my experience the latter has come to occupy a very minor role since the more concentrated forms of vitamin D have been available. In small infants larger doses of this substance are required to control tetany than rickets. I have given 20 drops of viosterol (or its equivalent) daily during the winter and fifteen or ten drops during the summer. Occasionally this dosage has been exceeded.

If one gives calcium and vitamin D in this manner the diet becomes less significant so far as these substances are concerned except in so far as a well balanced diet should always be provided. However I have found some benefit to be derived from choosing a combination which leaves an acid ash rather than alkaline. The extreme of this idea, of course, is the ketogenic diet. Its value in the control of epilepsy is well established though I doubt that it is commonly considered as an adjunct to calcium therapy.

Very important to this whole subject is the control of infection. As a part of the interim treatment of convulsions it assumes almost a major importance. This is of course very apparent so far as acute infection is concerned since so many convulsions are brought on at this time. One very certain cause of convulsions in these acute infections is the sudden depressing effect that such infections have on parathyroid function. Experience with borderline cases shows unmistakeably that such incidents cause an acute suppression of the parathyroid glands just as occurs in the pancreas in diabetes or the adrenals in Addison's Disease. If acute infection can do this it is reasonable to assume that chronic infection will also increase the strain and make these glands less capable of meeting the demands made upon them. Thus the removal of chronic infection is an important adjunct to the prevention of convulsions in children, and it works through the medium of the calcium metabolism.

Parathyroid medication has no place in the interval treatment of convulsions. Its constant use has undesirable effects which are not justified. However its value as an emergency treatment should cause the physician to acquaint the parents thoroughly with situations such as acute illnesses which are prone to bring on convulsions in their children so that they may co-operate with the physician to a maximum degree. The timely injection of parathyroid extract will often avert a convulsive seizure. On the other hand drugs may be very important in the interval. Where advisable such drugs as phenobarbital, bromides, etc., should be used in conjunction with active calcium therapy.

Conclusions

Calcium therapy has a very definite place in the control of the convulsive disorders of infancy and childhood. It constitutes the specific treatment for a large number of such cases. For the others, if it is intelligently applied, it acts as an important ally to the other accepted measures of control.

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Epidemic Meningitis*

Proposed Measures for the Reduction of Its Recent High Case Fatality

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THE MOUNTING case fatality of epidemic meningitis, a disease for which we have so long had an antiserum, is deserving of careful therapeutic inventory on the part of clinical investigators.

The reported cases of meningitis in the United States have increased periodically since 1913 (Fig. I)[1] and the percentage mortality has risen correspondingly during the same period of time.

In spite of our escape from large outbreaks in Minnesota during recent years we have experienced an increasingly high case fatality as illustrated in Figure II.

A study of epidemiology in the recent outbreaks making up the nation-wide increase reveals a rather unusual age grouping with high morbidity among very young and relatively old individuals. This has held true to some extent in Minnesota. It is perhaps reasonable to assume that death in such instances is often favored by greater susceptibility in the type of host and by increased virulence resulting from the epidemic nature of many contributing outbreaks. The control of the latter factor is, of course, a problem concerning which public health officials are extremely vigilant.

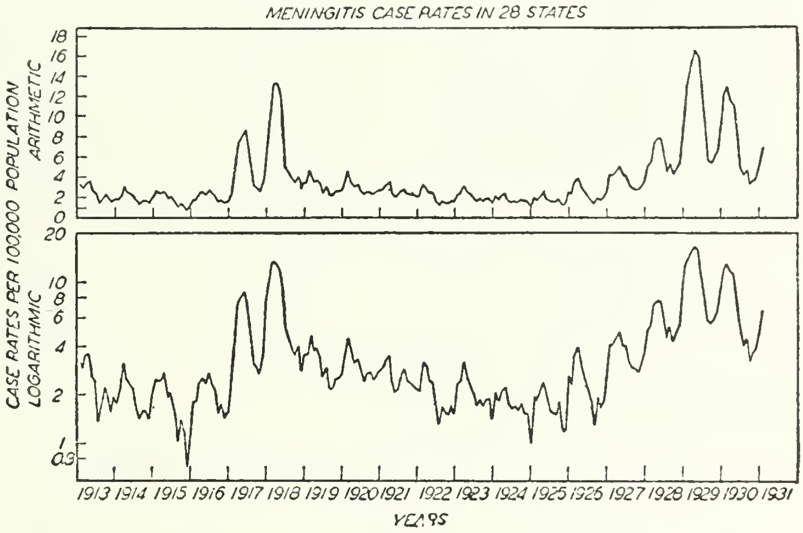

FIGURE 1

Earlier Diagnosis

To accomplish a reduction in the number of deaths as this disease presents itself, more attention must be devoted to early diagnosis and more adequate treatment. Flexner demonstrated long ago that the percentage mortality in meningitis when treatment is instituted during the first two days is only one-third of that which results when

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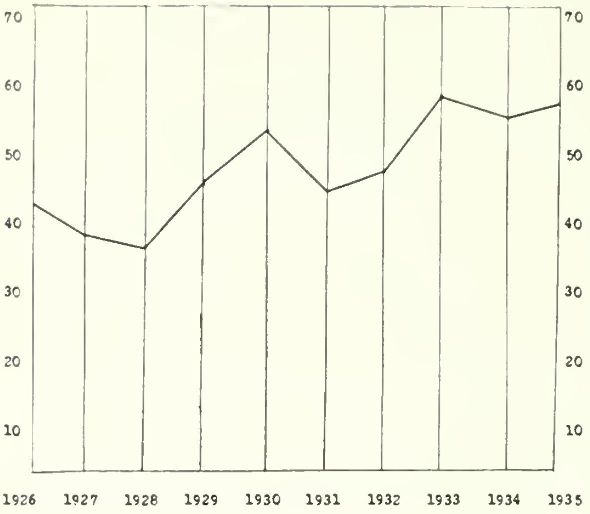

FIGURE 2

treatment is delayed to the seventh day. Misleading symptoms frequently account for such delay. It must be re-emphasized that meningeal signs often occupy a minor, even a negligible, part in the clinical picture of early meningitis.

Numerous cases occur with preliminary symptoms of otitis, sinusitis, rheumatic fever, gastrointestinal disturbance and upper respiratory infection in which nose and throat cultures for meningococcus, careful neurological examination and early spinal puncture may save embarrassing delay. In those cases with skin manifestations a rapid diagnosis can often be made by finding the meningococcus in direct smears from petechiae or from the blood. Cultures may likewise help. Cases such as the following illustrate the potential value of these procedures:

Case I. Female, age 6 years. Sore throat, headache, macules and petechiae in the skin. Petechial and spinal fluid smears positive for meningococci. Prompt recovery with serum therapy.

Case II. Female, age 44 years. "Acute rheumatic fever," headaches, erythema multiforme. Hospitalized twenty-two days before diagnosed correctly. Spinal fluid culture (22nd day) positive. Refractory type (see cistern case No. 9, table I).

Case III. Male, age 22 years. "Sinusitis." Treated three weeks. Irrigation performed. Persistent headaches. Stupor 23rd day. Spinal fluid 1200 cells. Nasal cultures found positive (post humously).

Case IV. Female, 3 months. Otitis media one week. Slight stupor. Smear of spinal fluid and aural exudate positive for meningococcus. Recovery with complicating uveitis.

Case V. Female, age 5 years. Pneumonia with complicating meningitis. Laboratory report "pneumococcus"; antimeningococcus serum given. Recovered. Organism found later to be meningococcus rather than pneumococcus.

Case VI. Male, 8 months. Vomiting, diarrhea, fever and hyperesthesia. No neck rigidity. Spinal fluid culture positive. Prompt recovery with serum treatment.

Cultures from the nose and throat, from skin lesions and from all exudates to determine the predominant organism in upper respiratory infections should certainly be utilized to a greater extent in daily medical practice. By so doing and by thinking in terms of meningitis, especially in children who are sick from obscure cause, the all too common picture of neck rigidity, opisthotomus and semi-coma, which is an indication of well advanced disease, may be avoided.

Serum Treatment

Experience with the serum treatment of meningitis has shown that thorough drainage of the subarachnoid space, moderation in the frequency and dosage of intra-spinal serum and cerebral concentration of the serum are fundamentals most conducive to a favorable outcome. Air injection at intervals during spinal drainage frequently increases the flow which, to be adequate, should total 30 to 60 cc. in children and 80 to 100 cc. in adults. To facilitate cerebral concentration of serum the foot of the bed should be elevated after treatment. Neal[2] and other observers with a wide experience disapprove of the intravenous method of administration of serum except in septicemic cases. It is tolerated better by the intraspinal route. A shorter interval than twenty-four hours in spinal treatment is not desirable since serum is still present in appreciable concentration, valuable phagocytic cells are removed and a debilitating effect on the patient is often noted.

In the more advanced cases exudate sometimes obstructs the normal avenues of communication so that proper drainage and cerebral concentration are interfered with. Early resort to cistern treatment in such cases will frequently yield brilliant results. Altho the procedure must be considered as a serious undertaking it is probably often postponed too long when it is indicated. In a series of fourteen partially obstructed, refractory cases with a poor prognosis shown in table I, the relatively low percentage mortality (35.7 per cent) compared to that for all cases (54 per cent) suggests the conclusion that this

TABLE I
CISTERN TREATMENT IN MENINGITIS

Case	Sex	Age	Duration (Days)	Remarks	Cause	No. Cisternes	Course	Results
1	F	63	9	Heart disease—chronic.	Poor drain. No imp.	1	Temp. imp.	D*
2	M	36		Sympt. unimproved. Fl. imp.	Obstruction and delirium.	1		R**
3	M	7	8	29,000 cells—delirium.	Poor drain. No imp.	4	Deaf.	R
4	F	8	6	48,000 cells.	Poor drain. No imp.	1	Temp. imp.	D
5	F	1½	6	49,000 cells—comanystagmus.	Poor drain. No imp.	6	Blind.	R
6	M	2	6	21,000 cells—coma.	Unimproved after 300 cc. sp. route (2½ weeks). Poor flow.	3		R
7	F	6 mo.	4	Coma.	Poor flow.	4 (1 vent)	Pneumonia day of discharge.	D
8	M	46	8	Coma.	Unimproved after 410 cc. sp. route.	2		R
9	F	56	25	Multiform erythema and rheumatism.	Unimproved after 360 cc. Poor flow.	4		R
10	F	62	5	Coma. Mastoiditis (meningococcic).	No flow.	2	Temp. imp.	D
11	F	5	3(?)	"Sinus" trouble.	Poor flow.	2	Unimp. after 295 cc.	R
12	M	24	3	Deep coma—cyanosis. 52,000 cells.	Poor flow.	20	Blindness. (1 eye.) (Perm.)	R
13	F	1½	3	Deep stupor.	Unimproved after 8 cc. taps and 105 cc. serum. Poor flow.	3		R
14	M	55	4(?)	Jailed for "Delirium Tremens." Epid. meningitis.	Unimproved after 11 sp. 315 cc. antitoxin. Poor flow.	5	Pneumonia.	D

CASE FATALITY RATE ....
ALL CASES—M. G. H. ('30-'36) 51.5%
ALL CASES—MINN. ('30-'36) 54.0%
SEVERE CASES—M. G. H. ('30-'36) CISTERN TREATMENT 35.7%

D*—Died.
R**—Recovered.

measure should have a definite place in our therapeutic armamentarium.

Antitoxin Treatment

Ferry[3] demonstrated in 1931 that soluble exotoxins could be obtained from the four Gordon types of meningococcus, that these produced the same symptoms as did meningococci when injected intrathecally in monkeys and that a polyvalent antitoxic horse serum could be prepared which was effective therapeutically. Hoyne[4] reported a marked reduction in fatality rate after using this antitoxin alternately with antimeningococcic serum in the same series of cases. He recommends its use in very large doses intravenously (60 to 100 cc. daily at first) and intraspinally (20 to 40 cc. daily).

During the past year we have been impressed by the striking results obtained following this method of treatment in a small series of cases in which antiserum seemed relatively ineffective. It should be emphasized, however, that extreme caution must be exercised in testing for sensitivity particulary when giving the antitoxin intravenously.

Active Immunization

Ferry[3] has demonstrated that individuals who are susceptible to a skin test dose of meningococcus toxin can be rendered immune to this by repeated injections of toxin.

Though no clinical data are as yet available to prove that active immunity against the disease can be attained it is hoped that this interestng work may yet lead to such an accomplishment.

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The JOURNAL LANCET

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MINNEAPOLIS, MINN., MAY, 1936

ANNUAL MEETINGS

The time has come to sound the call for all good members to attend the annual meetings of their respective associations.

May will be a gala month for postgraduate work. Minnesota will meet at Rochester the 3rd to the 6th, South Dakota at Sioux Falls the 4th to the 6th, and North Dakota at Jamestown the 17th to the 19th.

Programs will be sent to members and it is superfluous for us to comment upon them here. Every successive year the officers of the various associations do their utmost to have the gathering excel anything that has ever been seen or heard before. One can plan to attend with full confidence that such will be the case this year. It is gratifying to see the publicity that is being given more and more by the lay press to these meetings. Your patients will expect you to attend, which makes it easier now to explain. With a little added publicity it may become embarrassing to tell them if and why you do not.

It is and should be the proud boast of the profession that there are no strangers among us. We have the same problems to meet and at these gatherings we may discuss them with a common sympathy. We renew our acquaintance with old friends and meet new ones, thus adding interest and inspiration for our work. Life is made pleasanter and it is decidedly worth while. A. E. H.

MEDICAL HISTORY PAR EXCELLENCE

Medical reminiscences have figured largely in the best sellers of recent years. Witness the popularity of the *Story of San Michele* and *Fifty Years a Surgeon*. That these books have found a warm welcome with the general reading public may come as a surprise to the busy practitioner who has only leisure enough to thumb through them hurriedly. To their medical colleagues they offer twice the interest that they do to the lay public. The volume published by the North Dakota Medical Association in 1926 contains material that ranks in interest with the above mentioned titles and much besides. Dr. James Grassick of Grand Forks compiled North Dakota medical sketches and abstracts to fill the gap left by the destruction of the state society's records in a fire. That Dr. Grassick has done more than fill the gap is to the advantage of every reader of the volume. An informed and scholarly gentleman, Dr. Grassick's literary style has the fluency and ease of a popular writer. In addition, Dr. Grassick's personal participation in much of the history which he records adds the touch which makes this record come alive.

The chapters on the pioneer physician, the expedition of Lewis and Clarke, the irregular, and the army doctor appeal not only to the medical profession but also to the reader of American history, customs, and manners. The chapter on the irregular doctor testifies to Dr. Grassick's breadth of understanding, since he is not adverse to assigning honor where honor was due, although the acquisition of the title of doctor by that individual was irregular. This class of practitioner which flourishes in any newly opened country is not the least colorful of its inhabitants. The popularity of *John Marsh, Pioneer* illustrates that. In fact, any reader of American medical history cannot afford to miss the first third of Dr. Grassick's book.

The history of the formation of the medical society, biographical sketches of the presidents, the establishment of the boards of health and medical examiners, etc., while of intense local interest, have likewise a general appeal due to Dr. Grassick's skillful recounting. Here the universal is implied in the particular, for the experiences of the North Dakota physicians is typical of all the states in the pioneer West.

The official history of the district medical societies is preserved here as well as a roster of all the physicians which registered in the Dakota territory from June, 1885, to June, 1890.

At the ripe age of eighty-five, Dr. Grassick has just completed the second volume of his history of North Dakota medicine, which is to be published by the state society. Here again, Dr. Grassick's active part in the medical circles of North Dakota insures the interest of his data. Readers of the first volume await its publication, while readers to whom both are new have a pleasant surprise in store for them.

The North Dakota Medical Association is fortunate in having the destruction of its records rise phoenix-like in Dr. Grassick's two volumes of medical sketches and abstracts. Every state society could wish their own records interpreted and preserved in just such a manner by as talented and interested an historian as Dr. Grassick.

J. A. M.

FLOOR SEATED KINDERGARTENS

Calling all cars—and inasmuch as we should like to reach the ears of the pediatricians who are always on the go, we are broadcasting in this *special* number on a something-should-be-done-about-it subject.

Will someone please enlighten us on the necessity of children in kindergartens being seated on the school room floor? When the teacher is asked this question, she can give no satisfactory answer. Sensing the implication, however, she goes on to testify that "the-little-darlings-aren't-they-sweet do not sit on the floor throughout the entire session." Well, that's like saying that we do not serve typhoid-contaminated water all the time—only at half-hour intervals—and the victims die off the premises. The health commissioner's attention was called to this matter eight or ten years ago but the children are still sitting on the floor.

Friedrich Fröbel is dead and he can not be sworn, neither should he be sworn at; we would not lay this crime at his door. But tell us. Is there anything so irresistibly cute about little tots grouped in a circle on the floor even during the story-telling hour? Not to the sanitarian, there isn't. He thinks of floor drafts and dirt and the resultant sniffles and cystitis which may lead to God-knows-where. Infantile cystitis should be called the floor sitter's disease and it should be borne in mind that this is the age of greatest susceptibility to primary tuberculosis. Physicians, please, won't *you* do something about it? In the meantime, we suggest that children subjected to the imposition be given hot baths on their return home to re-establish circulatory equalization.

A. E. H.

GROWING SIGNIFICANCE OF LIPID METABOLISM

In recent years, interesting disturbances in lipid metabolism have been discovered in such disorders as: Niemann-Pick Disease, Essential Xanthomatosis (Schüler-Christian Disease) and Gaucher's Disease. According to Klenk there is a marked increase in the sphingomyelin content of the liver, spleen and brain in Niemann-Pick Disease. Essential Xanthomatosis is associated with abnormal relationships of the cholesterol and cholesterol esters, while Gaucher's Disease appears to be related to a disturbed function of the phospholipids of the lecithin type. The exact significance of these disturbed relationships, however, is not entirely comprehended.

For many years there has been a great deal of interest in the function of the fats and fat-like substances as related to various pathological conditions. Such men as Thudicum, MacLean, Leathes, Levene, Bang and Bloor are identified with early developments in this field. Bloor, for example, found that there was an alteration of the lecithin : : cholesterol ratio of the blood in arteriosclerosis. Other workers observed that the convulsions of epilepsy appear to be associated with changes in the ratio of cholesterol to lecithin. Several observers have reported that anemia of various types may be associated with disturbances in various fractions of the blood lipids. The marked degrees of alteration in the blood lipids in nephrosis and diabetes are of special interest to many. There are other pathological states, such as obesity, hypothyroidism, fatty degeneration of the liver and certain degenerative nervous diseases which show evidences of abnormality of the lipid constituents of the various tissues. Such physiological states as lactation, menstruation and pregnancy are known to be associated with definite changes in the blood lipids. More intensive investigation is necessary to definitely evaluate the full significance of these disturbances in the lipids of the body.

Another phase of lipid metabolism which has been of particular interest is based on the observation of Burr and Burr: that the unsaturated fatty acid, linolic, (called vitamin F by some investigators) is necessary for the normal nutrition of rats. Up to the time of this discovery desaturation was believed to be a normal process in the metabolism of fats; so that it was particularly surprising to find that the animal organism was unable to synthesize this particular fatty acid. Although there is no definite indication that unsaturated fatty acids play an important role in human nutrition, recent studies on the relationship of the lipids to infection suggest that they may be related to the problem of immunity. Some evidence has accumulated which indicates that eczema may be related to a disturbance in the metabolism of these compounds.

There are many phases of lipid metabolism regarding both normal physiological function and various pathological states which require further study. The time consuming and technically difficult procedures necessary for lipid determination together with the lack of standardization of the various methods used, no doubt has delayed progress in this important field. When the methods for lipid determination are as simplified and standardized, for example, as those for blood sugar or calcium, rapid progress in the solution of many clinical problems may be expected.

Arild E. Hansen, M.D.

SOCIETIES

FORTY-NINTH ANNUAL MEETING of the NORTH DAKOTA STATE MEDICAL ASSOCIATION

Jamestown, May 17, 18, 19, 1936

Sunday, May 17

8:00 P. M.—House of Delegates, Gladstone Hotel.

Monday, May 18

9:00 A. M.—Registration, Masonic Temple.

9:00 A. M.—North Dakota Health Officers Association, Masonic Temple.

10:00 A. M.—House of Delegates, Gladstone Hotel.

12:00 M. —Luncheon, Gladstone Hotel. Address by Dr. K. E. Miller, U. S. Public Health Service, Washington, D. C.

2:00 P. M.—North Dakota Academy of Ophthalmology and Oto-Laryngology, Gladstone Hotel.

2:00 P. M.—North Dakota Health Officers Association, Masonic Temple.

7:00 P. M.—Annual Banquet, Masonic Temple.

President's Address, Dr. A. D. McCannel, Minot.

"Modern Methods in Tuberculosis Control," Dr. J. A. Myers, Minneapolis, Minn.

"Legislative Prospects," Dr. L. W. Larson, Bismarck.

Tuesday, May 19

9:00 A. M. to 12:00 M.—Masonic Temple

"Radiographic Studies of Fractures of the Extremities," Dr. H. M. Berg, Bismarck.

"Physiology of the Colon with Medical Aspects of Carcinoma," Dr. E. G. Wakefield, Rochester, Minn.

"Carcinoma of the Colon," Dr. C. W. Mayo, Rochester.

"Surgical Treatment of Hydronephrosis," Dr. F. E. B. Foley, St. Paul.

"Common Skin Diseases," Dr. Henry E. Michelson, Minneapolis.

12:00 M.—Gladstone Hotel

Luncheon.

2:00 to 5:00 P. M.—Masonic Temple

"Endocrine Therapy in Gynecology," Dr. G. E. Hudson, Minneapolis.

"Prognosis in Coronary Thrombosis," Dr. F. A. Willius, Rochester.

"Artificial Feeding in the New Born," Dr. F. C. Rodda, Minneapolis.

"Coronary Artery Diseases," Dr. Donald McCarthy, Minneapolis.

"Diverticulitis of the Colon," Dr. R. E. Weible, Fargo.

The General Committee on Arrangements is composed of Dr. J. D. Carr, Dr. P. G. Arzt and Dr. Lloyd DePuy of Jamestown to whom requests for reservations and other matters in regard to the meeting may be addressed.

NEWS ITEMS

Dr. H. S. Diehl, dean of medical science at the University of Minnesota is spending a few weeks in California.

Dr. E. G. Balsam, Billings, was reappointed by Gov. Holt as a member of the Montana State Board of Health.

Dr. C. W. Robertson, formerly of Minot, has moved to Jamestown, N. D., where he will continue his practice.

Dr. and Mrs. J. C. Litzenberg have returned to their Minneapolis home, after spending several months in Florida.

Dr. C. G. Quammen, formerly of Delavan has moved to Mantorville, Minn., where he will continue general practice.

A $350,000 addition to the Abbott Hospital will be constructed this spring, which will add 100 beds to its capacity.

Dr. E. M. Fitzgerald, formerly located at Minneapolis, has opened offices for general practice at St. Peter, Minn.

Dr. E. A. Pray, Valley City, N. D., is the newly elected president of the North Dakota Anti-Tuberculosis Association.

Dr. A. J. Movies, Billings, Mont., is at Rochester, Minn., where he is spending several weeks in post graduating work at the clinics.

Dr. J. H. Garberson, Miles City, has been reappointed to serve seven years as a member of the Montana Medical Examining Board.

Dr. G. L. Countryman, Grafton, N. D., had the misfortune to fracture his ankle, by a fall on the slippery icy walk on his way to visit a patient.

Dr. H. A. Brandes, one of the prominent physicians of Bismarck, N. D., has been elected a captain of the North Dakota National Guard.

Dr. A. E. Myrick, one of the pioneer physicians of Stanford, Mont., celebrated his 40th anniversary of medical practice on March 17.

Dr. N. M. Watson, who has been in active practice for over 40 years at Red Lake Falls, Minn., died last month, the result of a heart attack.

Dr. Thomas L. Hawkins, was named president of the Lewis-Clark County Medical Society at its annual meeting held at Helena, Mont., last month.

Dr. T. Greenfield, has purchased the practice of the late Dr. V. P. Johnson, at Delano, Minn. Dr. Greenfield is a graduate of the University of Minnesota.

Dr. H. D. Kistler, Butte, Mont., died recently from injuries received in an automobile accident. Dr. Kistler was president of the Murray Hospital of that city.

Dr. W. H. Thompson of the University of Minnesota, was the principal speaker at the April meeting of the Seventh District Medical Society held at Sioux Falls.

Centerville, S. D., lost its pioneer physician in the passing of Dr. E. L. Syverson, on April 8, as he had been in active practice in that community for over 36 years.

St. Barnabas Hospital, Minneapolis, has started construction on a $150,000 five story addition to its present buildings, which gives them a capacity of 150 beds.

The University of Minnesota Medical Alumni will hold their annual banquet in Kansas City during the American Medical Association meeting Wednesday evening, May 13, at the Hotel Baltimore.

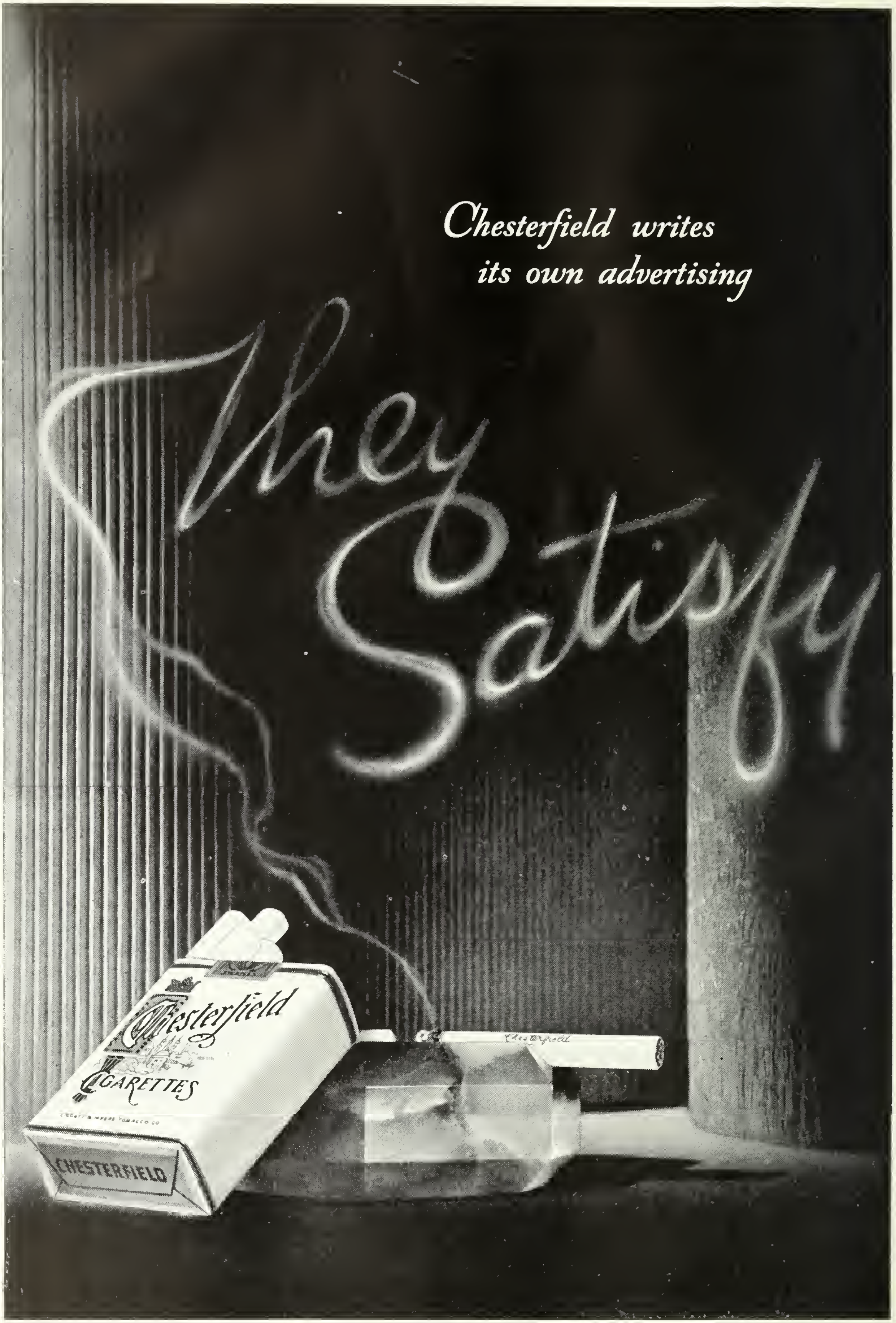
Dr. J. A. Myers, Minneapolis, was the guest speaker last month at meetings of the California Tuberculosis Association, Sacramento, Oregon Association at Portland and Nebraska Association at Lincoln.

Dr. Harry Cannon, one of St. Paul's well known physicians, died last month at San Diego, Calf., after a short illness. Dr. Cannon was 73 years of age and a graduate of Washington University, St. Louis, Mo.

The regular April meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, with Drs. Hartig and Newhart, Minneapolis, and Dr. A. Schwyzer, St. Paul, as speakers on the program.

Dr. Edwin O. Swanson, who has been in active practice at St. Paul for the last 20 years passed away on March 29, after an illness of two months. Dr. Swanson was a graduate of the University of Minnesota in the class of 1917.

Dr. Ernest R. Anderson, assistant chief surgeon, Great Northern Railway, Minneapolis, addressed the Hill County Medical Society at Havre, Montana, on April 8, and the Cascade County Medical Society at Great Falls, Montana, on April 9, on "Fractures."



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New Series

Syphilis and Gonorrhea As a Major Public Health Problem*

R. A. Vonderlehr, M.D.†
Washington, D. C.

WHILE syphilis and gonorrhea have been known to the medical profession for many years, their importance to public health has been appreciated only in the past two decades since this important movement has gained impetus. Earlier sporadic attempts were made to control the dissemination of these diseases from time to time during the past four or five centuries. Many of these early measures were directed chiefly toward the abolition of prostitution and general improvement in public morals. In the fifteenth century, for instance, the town council of one of the cities of Scotland decreed that all such persons desist from their vice and work for their support lest they be branded and banished from the town.

At the present time officially recognized or authorized commercialized prostitution has been abolished in all English-speaking countries. On the other hand, attainment of the ideal of suppression of clandestine prostitution and promiscuity through legal means has thus far failed to accomplish its purpose. Present measures for the prevention of syphilis and gonorrhea, therefore, pertain chiefly to the practical application of the modern scientific principles of public health. The insidious character of these diseases, their widespread prevalence, and the relatively high cost of a program aimed at their control have led to a pessimistic feeling among health officers with the result that comprehensive programs have not been adopted in most areas. Health officers have clung to the belief, so deeply ingrained, that more progress could be made in public health by applying the limited available personnel and the restricted funds to the control of the more acute communicable diseases. The marked success which has been attained during the last few decades in the control of the acute communicable diseases has eliminated many of them as serious problems. The time has arrived, therefore, when health organizations will devote more of their resources to the control of syphilis and gonorrhea.

Prevalence

Morbidity and mortality reports are as unreliable an indication of the prevalence of syphilis and gonorrhea as of any of the communicable diseases. This fact has been known for many years. A large number of studies have been made of the prevalence and incidence of syphilis. Many of these were confined to selected population groups and a few have yielded information which is generally considered to be reliable.

In 1928 the health authorities in Germany described a method of establishing the prevalence of syphilis and gonorrhea by utilizing surveys of sources of treatment.[1] A few years later the Public Health Service began a series of surveys of sources of treatment for syphilis in this country.[2] Up to the present time surveys have been completed in forty-nine representative communities throughout the United States in co-operation with state and local health departments and the American Social Hygiene Association. Twenty-nine million of the nation's population or approximately one-fourth of the citizens of the country live in these surveyed areas.

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*Prepared especially for the Venereal Disease issue of THE JOURNAL-LANCET.

†Assistant Surgeon General, United States Public Health Service.

In conducting these surveys the sources of treatment were requested to report the number of cases of syphilis and gonorrhea seeking medical care during a given period. Further data pertaining to the chronicity of the infections and the duration of the treatment-observation periods were likewise requested. Practically 100 per cent of the questionnaires submitted to the sources of treatment during these surveys were returned.

As a result of this work it has been possible to establish the prevalence rate for cases of syphilis under treatment at any one time throughout the United States at 5.2 per 1,000 for the male population and 3.4 per 1,000 for the female population. For gonorrhea the rate is 4.9 per 1,000 male population and 1.8 per 1,000 female population. The total prevalence rate of syphilis and gonorrhea for both sexes is 7.7 per 1,000 population. In 38 communities additional data were available with regard to the race of the patients. The rate for Negroes infected with syphilis was 8.4 per 1,000 Negro population and for gonorrhea 3.4 per 1,000 Negro population. The rates in the 38 communities for the white population were 4.5 per 1,000 population for syphilis and 4.0 per 1,000 population for gonorrhea.

The annual incidence of syphilis and gonorrhea for the entire country has been estimated from these surveys. Considering only the early cases of syphilis and the acute cases of gonorrhea, it has been computed that 518,000 new cases of syphilis and 1,037,000 new cases of acute gonorrhea annually seek treatment in the United States. The total number of new venereal infections each year exceeds one and one-half million cases.

The Application of Control Measures

Even anyone unfamiliar with the technical significance of these high prevalence and incidence rates can appreciate the vast importance of these two diseases to the social and economic welfare of the nation. Despite the manifest seriousness of the problem, due importance has not been given to the control of the venereal diseases by health departments generally. Neglect of the problem is due particularly to the failure of the civil population to demand the institution of a comprehensive program and also to the high cost of venereal disease control work.

The time is now rapidly approaching when health departments will not be permitted by an aroused public longer to neglect the control of syphilis and gonorrhea. Under the authority of the recently enacted federal Social Security legislation, funds will be available to state and local health departments which may be applied to the control of these diseases. Appreciating the opportunity which is offered as the result of this new legislation, the Surgeon General appointed an advisory committee to recommend a venereal disease control program for application in state and local health departments. In formulating these recommendations the advisory committee described plans for control work which were not only far-reaching and comprehensive but were purposely of a general character.[3] The recommendation of general measures only was necessary in order that the program might be adaptable to the varying social and economic conditions in the several states.

In the general administration of the venereal disease control program the advisory committee recommended that such work should be integrated or performed in close liaison with the communicable disease division of the health department. At the same time it was felt that venereal disease control work should be conducted either under a separate division or subdivision with a high degree of autonomy. The direction of the program by a full-time venereal disease control officer was considered necessary and no exception to this rule should be permitted in the health department of any state or large city. A third important problem in the administration of the program was that of the provision of adequate funds. Two fundamental principles should be observed in determining the proportion of funds to be allocated to venereal disease control activities. First, there should be a carefully drawn state program to secure for the public adequate protection against the spread of disease by infected individuals, and for the individual patient adequate treatment, skilled medical care, and maximum privacy. Second, the allocation of funds should be made on the basis of the relative prevalence of the venereal diseases in proportion to all communicable diseases in the state's morbidity rates. (Figure I.) For the entire United States the venereal diseases represent approximately 20 per cent of all communicable diseases reported. Few health departments have followed a policy in financing venereal disease control activities based upon these two principles in the past.

Adequate Treatment Facilities

In the present state of our knowledge the control of the venereal diseases is primarily dependent upon the correct clinical management of early cases. No health program for the control of syphilis and gonorrhea can succeed unless the newly infected cases be given proper care. Appreciating this point, the advisory committee made recommendations for the development of treatment facilities in both urban and rural communities.

The establishment of new clinics or other institutions for treatment of syphilis and gonorrhea would not be justified in many parts of the country because excellent private facilities already exist. Private agencies have been handicapped frequently by inadequate financial support, and the reference of large numbers of patients for admission who constitute grave hazards to the public health. For this reason, it was recommended that existing clinics and other sources of treatment, if they are able to conform with minimum standards of efficiency, be subsidized by health departments in their respective areas. Polyclinics seem preferable to isolated clinics because in such clinics the reason for the patient's admission is unknown, because there are specialists in other lines of work for consultation, and also because in-patient treatment is available in most polyclinics if this becomes necessary.

In rural areas it was recommended that adequate treatment be achieved by extending subventionary assistance to properly qualified local physicians or by the provision of treatment to indigent patients by county health officers themselves, provided these officers have had proper training in the clinical management of such cases.

The principle of free distribution of antisyphilitic drugs to all sources of treatment regardless of the patient's ability to pay was approved. Where financial conditions permit the recommendation was made that not only should routine diagnostic laboratory services be made generally available but that at least one approved venereal disease diagnostic and treatment center be made available in each state. In such centers roentgenologic and special laboratory facilities should be provided for indigent citizens or those who because of limited financial means could not meet the regular fees of specialists for such services. In addition to this ambulatory consultant service, the diagnostic and treatment center should also provide for the hospitalization of indigent patients whose illness requires in-patient care.

What Treatment Accomplishes

The practical accomplishments of treatment in the public health control of syphilis can best be shown by citing certain findings of the co-operative clinical group of the Public Health Service. If therapy is started during the first year of the syphilitic infection and continued until adequate, the patient may expect results equivalent to cure in three out of four cases.[4] As here used, the term adequate treatment means the administration by the continuous alternating method of at least 32 doses each of one of the arsphenamines and of one of the bismuth preparations over a period of approximately 18 months. An exceptional opportunity for the prevention of the transmission of syphilis also exists in the treatment of early cases. The co-operative clinical studies have shown that when adequate treatment is given the communicable forms of relapse are prevented in practically all cases. As is well known the administration of antisyphilitic treatment terminates immediately the course of communicable lesions which are present before treatment is given.

The physician has an opportunity to prevent the transmission of syphilis from the pregnant woman to her unborn child which almost equals that for the prevention of the transmission of the acquired infection in the early stage of this disease.[5] It has been demonstrated that if treatment is started before the fifth month of pregnancy and consists of a minimum of 10 doses of one of the arsphenamines and accompanying heavy metal, the transmission of the disease to the fetus can be prevented in nine out of ten cases.

From the public health standpoint, therefore, the golden opportunity for the prevention of the transmission of syphilis exists during the early stage of the disease and during pregnancy.

Unfortunately, present knowledge of the clinical management of gonorrhea does not permit the standardization of therapeutic procedure. It is well known, however, that most properly managed cases of gonorrhea run, on an average, a course which is relatively benign and that recovery results within two to three months. The need for insistence upon the application of treatment for gonorrhea by physicians who are thoroughly experienced in this line of work is also well known. The treatment of cases by improperly trained physicians is not only useless but may be productive of considerable harm both from the standpoint of the public health and the individual.

The Application of Epidemiologic Procedure

The application of fundamental principles to the study of the transmission of syphilis has been made a routine procedure in certain health departments only in recent years. Such procedure was brought to public attention by the pioneer work of Munson in New York State.[6] In later years others[7] have extended such activities and the principle of epidemiologic investigation in venereal disease control work is now accepted by modern health organizations. Some of the most recent observations indicate that from a practical standpoint the danger period for the transmission of acquired syphilis is almost entirely limited to the first year of the disease.[8] The great importance of early syphilis in the control picture may be appreciated when it is realized that all authorities are now of the opinion that the first five years of the syphilitic infection constitute the only period during which acquired syphilis is ordinarily transmitted.

All workers in the venereal disease control program should insist upon detailed epidemiologic study of every early case of syphilis and gonorrhea. The epidemiologic work should be conducted under the supervision of the venereal disease control officer by thoroughly experienced medical follow-up workers. These workers should then be charged with two duties, each equally important: First, the epidemiologic investigation of the early case with the object of bringing such cases to treatment, and contacts with such cases to examination and treatment if necessary. Second, the follow-up of patients lapsed from treatment, especially those with infectious lesions. In no other phase of the application of epidemiologic methods is such tact and understanding required of the follow-up worker. Not only may the epidemiologic investigation arouse the distrust and ire of the patient but a worker with lack of training or understanding may cause serious familial or social complications. The medical follow-up worker for such investigations should, therefore, be appointed on the basis of real merit and experience and not because of spurious claims of ability or through political coercion.

The Informative and Educational Program

This part of the venereal disease control program should be prosecuted to the fullest extent of the health department's capacity. Its importance cannot be denied. Intelligent application of modern communicative methods should make it possible to give to every citizen concise and pertinent information relating to the prevalence and serious character of the venereal diseases. Every citizen should also know where treatment may be obtained should he be unable to meet the cost of adequate medical care. The importance of public support of the program must be repeatedly emphasized by prominent interested citizens since funds will only be made available by legislators because of insistent demand.

Medical schools should be encouraged by both private physicians and health officers to revise their curricula when necessary in order to place before all students the fundamental principles of the control of syphilis and gonorrhea. In such schools the proper management of early syphilis and syphilis in pregnancy should be particularly emphasized. With the co-operation of state boards of medical examiners the inclusion of proper information in the medical curriculum can be made compulsory. Such boards of examiners could do much to attain this end by requiring that at least one question pertinent to the public health control of these diseases be included in all examinations on clinical subjects.

A solution of the problem cannot be brought about without the assistance of physicians in private practice. Accepting this idea as a fundamental principle, all health departments and voluntary agencies should seek the aid of medical societies in inaugurating a comprehensive and enduring plan for informative work among private physicians. The final goal will not be attained until every physician in private practice understands and supports the basic points in the control program.

The Results of a Comprehensive Program

The critical observer will ask what may be expected from the adoption of such a complex program. Even under favorable conditions may we expect syphilis to be brought under control? This question is best answered by reference to certain articles which have appeared in the literature in recent years. Two years ago, Harrison,[9] as the result of the application of the venereal disease treatment scheme in England and Wales inaugurated in 1916, reported a material decrease in the incidence of early syphilis in those two countries. This worker also noted that the death rate among infants due to congenital syphilis was reduced to approximately one-third of the original figure within two decades. The marked success attained in the smaller European countries especially Denmark and Sweden, is a matter of common knowledge.

It might be said that perhaps conditions in the countries of Europe differ from those in the United States to such an extent that while success can be attained in foreign lands but little or no progress may be expected in this country. A recent report by Nelson[10] belies such a conclusion. This health officer has been able to show a decrease in the incidence of early syphilis in the state of Massachusetts, which is quite comparable with that in England and Wales. He has also discovered that in institutions rendering prenatal care and in which serologic tests for syphilis have long been routine procedure, the percentage of positive and doubtful reports in pregnant women has decreased from 9.9 during the period from 1915 to 1919 to 2.1 in 1934. This same observer has noted a decrease in the prevalence of neurosyphilis in Massachusetts of 32.3 per cent in 1934 over the year 1930.

The health departments in the areas in which this progress has been made perhaps do not face such serious hazards as those in many other states and countries. This fact, however, does not detract from the splendid results which have been attained and the individuals responsible for success deserve all possible credit. Their accomplishments should serve as a source of inspiration to other health departments and as a stimulus to the inauguration of more effective measures generally in the United States.

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Venereal Diseases Among College Students*

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EVEN among college students venereal diseases constitute an exceedingly important health problem. Students may have congenital syphilis, they may have acquired venereal disease before coming to college; or they may become infected during their college years. Once these diseases are diagnosed, modern treatment usually results in a cure. The chief problem with college students is to determine who are infected. Adequate physical examinations should discover existing infections, but the discovery of infections acquired during college years presents a more difficult problem. Students naturally are secretive about such infections and hesitate to apply to the college medical service for treatment. Experience indicates, however, that most of this difficulty can be overcome by handling venereal diseases as medical and not as disciplinary problems.

The Prevalence of Venereal Diseases Among College Students

An analysis of 5,000 routine Wassermann tests of students of the University of Minnesota reported several years ago showed that the inclusion of this test in the routine physical examination led to the diagnosis of syphilis in 0.17 per cent of the boys and in 0.25 per cent of the girls examined.[1]

These percentages represent five girls and five boys. Two of the girls had congenital syphilis; one was under treatment at the time of her physical examination; the other had received some intravenous medication after the death of her mother, but did not know for what purpose and failed to continue the treatment. The third girl had been having headaches over a period of four years; the fourth had no symptoms whatsoever. Of the five boys, one had a scar from a chancre and the history of a sore throat a short time previous to the examination; the second had had what probably was a chancre but had had no treatment; the third stated that six or seven years previously, after using a pipette in a drug store where he was working, he had had a lesion in his mouth which was slow in healing; the fourth and fifth gave no history of either primary or secondary lesions.

Although these 5,000 routine tests revealed only ten syphilitic infections, the diagnosis of this disease in an early stage is of such great importance that the test has been continued as a routine procedure in every periodic health examination. During the past two academic years, the incidence of positive reactors was 0.31 per cent in approximately 5,000 examinations.

This prevalence of syphilis, approximately one-third of one per cent, is the lowest which has been reported for any sizeable group of the population. Dodds[2] reported positive Wassermanns in 6.7 per cent of 2,000 pregnant women who were admitted to a hospital in Edinburgh; Williams,[3] 2.5 per cent among 4,000 pregnant women in a hospital in Baltimore; Vedder,[4] 16.8 per cent of 1,000 recruits who had been in the army less than one week; Dublin and Clark,[5] 5.8 per cent positive reactions among 3,000 cadet officers in training camps at the time of the World War; and Kaiser and Bolner,[6] six per cent of 1,084 men, and two per cent of 1,788 women who came to them as private patients for periodic health examinations. These individuals, they state, were about equally divided between those in moderate circumstances and the well-to-do.

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Gonorrhea is rarely discovered in routine physical examinations. In fact, the physical examinations of male students at the University of Minnesota include only a superficial examination for urethritis, while no examination of the genitals is included in the routine examination of girls. The result is that we have no information as to the prevalence of gonorrhea in either sex.

When students report to the health service with venereal disease, they are referred, if boys, to a genito-urinary specialist, and, if girls, to a gynecologist. A confidential relationship is maintained in the diagnosis and treatment of these patients. The result has been an increasing confidence on the part of the students in the treatment which they will be accorded at the health service.

In the early years of the health service relatively few students with venereal disease came for treatment, but as the character of the service has become known the proportion of these students has increased. During the past year the health service had under its care eight university girls with gonorrheal infections and five with syphilis; and 68 boys with gonorrhea and nine with syphilis. This is out of a student body of approximately 4,000 women and 6,000 men.

What proportion of the students who contract venereal disease report to the health service we have no way of knowing. Doubtless many who suspect that they have venereal disease turn to private physicians, quacks, or self-medication rather than a department of the university for treatment. Some of these, after wasting what money they have on ineffective treatment, eventually return to the health service for care. A few years ago the genito-urinary specialist of the staff estimated on the basis of reports from his student patients that approximately half of the boys with venereal disease were receiving treatment at the health service. He believes that today the proportion is higher. This, however, is merely a guess and may be grossly in error. As to the incidence of such infections among the girls there is even less of a basis on which to hazard an opinion. There is no question, however, in the minds of those engaged in the treatment of these patients and familiar with the problem of venereal disease in general that the prevalence of these infections among university students is far lower than it is among the young men and young women of corresponding ages in the general population.

The University of Minnesota is a large co-educational university in an urban center. What influence these factors have upon the prevalence of venereal disease no one knows. Some believe that the prevalence of such infections is higher and others believe that it is lower in smaller colleges or in non-co-educational institutions.

Making Contact With Patients

Most latent syphilitic infections may be discovered by the use of the Wassermann test as a routine procedure in periodic health examinations. The more difficult problem is to get students with acute infections to report to the health service. Probably the best manner in which to meet this problem is to so conduct the health service that students will have confidence in it and will habitually turn to it for advice in regard to medical and health problems. Consideration of venereal diseases in personal hygiene courses and announcements of health service policy in dealing with them will encourage students to report to the service when they suspect that they have such infections. Then, too, as students who are under the care of the health service realize that all treatment is on the basis of a strictly personal, confidential relationship, they will advise others that the health service is a good place to go for all sorts of medical care.

The channels through which students with venereal diseases reached the specialist who treats these conditions in the health service at the University of Minnesota during the past two years were as follows: Of the women with gonorrhea, one came to the health service because of a gonorrheal arthritis, the others because of leucorrhea or Bartholin abscesses; of the women with syphilis, one reported to the health service because of an iritis, one because of a skin lesion, and three were discovered to have positive Wassermann reactions through physical examinations. The men with gonorrhea sought treatment for urethral discharge, burning urination, balanitis or epididymitis. Of those with syphilis, two reported to a physician because of chancres, one because of a skin eruption, two for continuation of treatment; one was referred by an examining physician because of features suggestive of a congenital syphilis and three were discovered to have positive Wassermann tests on routine examinations.

Sources of Infection

The responsibility of physicians and of institutions which treat venereal diseases does not end when the patients are placed under adequate treatment. There is the added responsibility of attempting to prevent the further spread of infections from the same source. Most University students who contract venereal diseases are willing to give information concerning the sources of their infection. If the source happens to be a friend the patient is urged to prevail upon this friend to go to a physician for an examination and treatment. A report of the findings of this examination and the name of the physician who made it is requested. Under other circumstances, the probable source of infection is reported to the local health department for investigation.

The probable sources of infections of the students who were under the care of the Health Service of the University of Minnesota during the past two years were as follows: Of the women, one was infected by a University student who subsequently reported to the health service for treatment, two had been quite promiscuous, two had been "exposed" before coming to the University, the others failed to give information on this point. Of the boys, 14 blamed their infections on prostitutes, 11 on "girl friends," 11 on casual pick-ups, five on nurses, three on clerks, two on maids, two on bakery employees, two on "co-eds," one each on cashier, laundress, factory girl, and dancing teacher; two denied "exposure" and 20 did not state the probable source of infection.

Illustrative Cases

The types of problems encountered in dealing with venereal disease among college students are illustrated by the following brief case reports:

1. A young woman, 19 years of age, reported to the health service in February, 1935, with a history of having scratched herself on the right shoulder a week before. The scratch apparently had become infected and had not healed. There was evidently an adhesive dermatitis about the area of the original lesion. She was referred to the dermatologist on the staff who noted that the lesion looked suspiciously like syphilis. A Wassermann test was reported as four plus from two laboratories. No history of exposure or primary chancre could be obtained. As this patient was self-supporting and was unable to pay for treatments elsewhere, she was treated at the health service.

2. Patient T. S., a young woman of 21 years of age, came to the health service in September, 1935, with an acute iritis. She gave a history of an inflammation of the left eye for one day three weeks previously. This cleared up spontaneously but recurred. She was seen by the ophthalmologist on the staff, who treated her, took blood for a Wassermann test, and referred her for a check-up of foci of infection. The Wassermann was reported as four plus from two laboratories. This student has been under treatment at the health service, as it was impossible for her to have treatment elsewhere.

3. The other three women with syphilis during this two-year period were discovered by routine Wassermann tests done in connection with periodic health examinations. Two of these were older women, one 34 and the other 50 years of age. No definite history of primary syphilis could be obtained in either case. Both were advised to have treatment by their private physicians. The third patient was a girl 22 years of age who gave no history of primary or secondary lesions. Her Wassermann test, however, was repeatedly positive. She was treated at the health service as she could not pay for treatment elsewhere.

4. Patient L. J., a young woman 20 years of age, reported to the dispensary because of pain in one ankle. The ankle was red and swollen and she was admitted to the hospital. She had a moderate elevation of temperature for a few days and the possibility of acute rheumatic fever was considered. However, as one ankle was the only joint involved, a gonorrheal arthritis was suspected. Cervical smears showed the presence of gonococci. A blood culture taken at the height of the fever contained gonococci. This patient was in the hospital for several weeks, responding little to ordinary types of therapy. Fever therapy was finally used, following which the symptoms in the ankle cleared up within a few days. This student was self-supporting and unable to provide herself with care elsewhere. She had had no symptoms of leucorrhea, although she said that she had had several "exposures."

5. A young man, aged 20 years, living in a small town, contracted gonorrhea in July. For this he was treated by the family doctor and pronounced cured. After coming to the University in October, discharge recurred. At this time he sought treatment at an advertising clinic in St. Paul. After about six weeks he realized that he was being improperly treated. As a result of his expenditures for this worthless treatment he was forced to drop out of school and look for work. Finally he discussed his condition with an R. O.

T. C. officer who brought him to the health service. Since he was out of school he was referred elsewhere for treatment.

6. This young man, 24 years of age, was found to have a positive Wassermann reaction on a routine health examination. Hutchinson's teeth and saddle nose were clinical evidences of congenital syphilis. Spinal fluid was entirely normal. He was advised to correspond with his family and ask them to have Wassermann tests performed. As a result of this, his father, mother and one brother were found to have positive reactions. All are now under treatment of the family physician.

7. A young man, aged 20 years, came to the health service complaining of itching hemorrhoids. On examination the clinician noticed a generalized papular eruption on the body, prescribed a local anesthetic salve for the anus, and took blood for a Wassermann test. This was reported positive and the patient was referred to special clinic. Here examination revealed a chancre of the anus and maculo-papular syphilitic eruption of body. The patient admitted having had coitus in ano with his employer. He was treated for three years, receiving 48 injections of neo-salvarsan and 96 injections of bismuth. Wassermann test was negative three months after beginning of treatment and persisted so to the end. Spinal fluid examination at the end of treatment showed no evidence of syphilis. Discharged, cured.

8. A senior student was referred to the health service in October by a private physician who had treated him for gonorrhea since July. Discharge was still present and a smear contained gonococci. Examination revealed a pin point meatus. Following the opening of this the condition cleared up under routine treatment.

9. A male student, aged 30, was referred to the health service by a private physician. He had had a hard painless sore on the penis for one week. Last exposure was to a prostitute, three weeks before. The name and address of the prostitute were reported to city board of health. Two days before the patient came to the health service a private physician had prescribed the use of calomel powder locally. Dark field examinations repeated nine times revealed no spirochetes. Examination of material obtained by gland puncture also was negative. The Wassermann test of the blood was repeated three times each week, with the first positive reaction at end of third week. Treatment was started at this time.

10. A young man, aged 20, complained of discharge of five days' duration, and reported exposure to a prostitute seven days before discharge began. The name and address of the prostitute were reported to the city health department. Due to lack of funds patient treated at the health service.

11. A physician of the health service staff was called to a rooming house to see a male student, aged 21 years, with fever and pain in scrotum. Examination revealed a swollen left epididymus and discharge at meatus of urethra. Patient was admitted to the hospital. A smear from the meatus contained gonococci. Patient states that he had gonorrhea a year ago at which time he was treated and pronounced cured. Since then he had had no intercourse but occasionally had noticed a purulent urethral discharge. Due to lack of funds this patient was treated at the health service.

12. This young man, aged 20, was referred to health service by a previous patient, because of urethral discharge and burning urination of one day duration. He had been "exposed" to a girl whom he "picked up" four days previously at a night club. Smear showed gonococci. Patient was referred to his family doctor for treatment.

Administrative Practice

In the past the usual method of dealing with venereal diseases in college students was to expel those who were known to be infected. This led to secretiveness, resentment, hypocrisy and poor treatment. By this practice college authorities may have thought that they were protecting the good name of the institution, but they were doing nothing constructive for the physical or moral welfare of their students. In fact, they were inviting dishonesty and playing into the hands of quacks and charlatans, the end result of which could only be chronic invalidism for those who were infected and continued innocent exposure of their associates.

Accurate diagnosis and competent treatment is the basis of a program for the control of venereal diseases. In most situations college health services need to provide treatment for certain students, although many can be referred to physicians in private practice.

Once the basis of a confidential relationship has been established the physician should determine the source of infection and guide the patient in the formulation of a pattern of future conduct. As a matter of general University policy, no disciplinary action should be related to the proper medical treatment of the patient. On the other hand, the college physician has a responsibility to the rest of the student body as well as to the individual patient. Most college students who contract venereal disease do so as the result of a temporary departure from their usual standards of conduct, but occasionally the infected individual is habitually promiscuous and clearly an undesirable element in a college or university community. The physician usually has no difficulty in recognizing such persons. He may request such persons to withdraw from the institution or he may report to the Dean that an investigation of this student's character and habits is desirable. If such students are expelled the action is taken not because they have venereal disease, but because the existence of the venereal infection has served to call attention to personal characteristics which make them undesirable members of the student group.

The Educational Approach

It is generally conceded that young men and young women of college age should be properly informed on matters of sex so that they will be able to think and act intelligently in situations in which sex is involved. There is, however, no unanimity of opinion as to how this instruction can best be accomplished. A special lecture or course of lectures on the subject has been the usual method employed, but there is a growing opinion that this subject can best be dealt with as an integral part of courses in personal and community hygiene. If, as is frequently the case, the personal hygiene course contains both men and women, the sexes can be separated for these discussions. The major emphasis in such instruction should be placed upon the normal aspect of sexual development and life, but students should be acquainted also with the problems and dangers of venereal disease. Experience has shown that the fear of venereal disease has not been a potent restraining influence in the sexual practices of men and women, but the danger and the seriousness of such infections should be presented.

A unique opportunity for effective personal instruction in relation to sexual morality and venereal disease is presented when students come to the health service for treatment of one of these diseases. Occasionally students are nonchalant about these infections but usually they are greatly disturbed, both over the disease which they have acquired and over the lapse of moral standards responsible for it. The attitude of the physician is all-important in handling such situations. The occasion may be passed over as an incident from which the individual will learn little or nothing, or it may be used as an opportunity to aid the individual to form a sound pattern of sex life. This educational opportunity should not be neglected.

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Individual Prophylaxis in Theory and Practice As Applied to Syphilis and Gonococcal Infections*

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PROPHYLAXIS and prevention are two words constantly used in medicine and public health with widely different meanings and limitations as applied in a discussion of various diseases. Usually, the term prophylaxis becomes identified in the public mind with some one outstanding measure such as vaccination against smallpox, or the treatment devised to prevent development of rabies after the bite of a rabid dog. But frequently the idea becomes broadened out to cover every measure and circumstance which may operate to prevent exposure to infection, or abort the full development of a disease. Prevention on the other hand is more generally associated by the layman with sanitary measures for safeguarding the environment of the individual, his food and water supply, protecting him against insect carriers of disease and unhealthful housing and living conditions generally.

Also we must remember that among the group of so-called venereal diseases—syphilis, gonorrhea, and chancroid have long been recognized by

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the public and the medical profession as outstanding communicable diseases transmitted almost entirely by intimate contacts among human beings which permit direct transfer of the causative organisms to mucous membranes of the sexual system, or occasionally to mucous surfaces of the mouth, eyes, and other structures, or more rarely to the skin, through all of which they may find entrances into the body.

Chancroid seems to be yielding to increasing standards of personal cleanliness, plentiful use of soap and water and the seeking of prompt treatment for this disturbing infection. Thus cleanliness and personal hygiene may be counted on as important prophylactic aids in preventing contraction of this disease.

But science as yet has given us no hope for banishing syphilis or gonorrhea by such simple means, and no encouraging promise of immunizing methods which may be applied in advance of possible exposure to either of them. Except for the anti-syphilitic treatment of a pregnant woman which safeguards her child before birth, there is no widely applicable method of treatment which might administratively be comparable in results to anti-rabic treatment, or to the prophylactic use of quinine by those who must live under conditions of constant exposure to malarial infection. The result is that for practical purposes prophylaxis of syphilis and of gonorrhea are usually considered in the narrow terms of those last-minute measures which individuals may apply just before exposure, or during and immediately after exposure to infection.

For the purposes of this symposium, only those procedures of value at the time of exposure will be discussed. Full consideration of this subject, however, requires discussion of the entire range of measures from (1) those dealing with environment and education calculated to reduce the opportunities and likelihood of individuals exposing themselves to infection, through (2) those dealing with the immediate circumstances and processes of transfer of the infecting agent from the infectious person to the susceptible one, and (3) the early treatment measures which may reasonably be counted upon to limit infection if it occurs, or prevent serious consequences and destruction of tissue. For our present purpose, it will be assumed that the first group of measures is important and their promotion highly desirable; likewise that the third group is equally essential both for protection of the uninfected people in a community and for the welfare of the infected. This middle group of measures concerns chiefly those who have failed to understand or profit by the general knowledge and protection which the community has offered them; yet may still be aided to prevent the development of infection, though possibly exposed.

It is necessary to bear in mind also that conditions usually attending the promiscuous and casual sexual contacts chiefly responsible for the wide distribution of these diseases do not permit of determining in advance whether one of the partners is infected with syphilis or gonorrhea (or both) and is infectious for the other partner. Consequently, the only practical procedure is to assume exposure in all such contacts, and to apply this group of prophylactic measures as first aid so to speak to all concerned, even though our studies indicate that often not more than one out of eight such "exposures" are followed by infection when no precautions are taken. Thereafter efforts should be made to determine definitely who has and who has not been exposed, and proceed with supplemental observation and medical measures for those requiring them.

The classic example of brilliant success in applying measures coming within this middle group is the chemical prophylaxis for gonorrheal ophthalmia. The essential factors have been: (1) Definite knowledge of the time of exposure, i. e., the birth of the baby at which time the gonococci escape from the tissues of the mother and lodge under the eyelids of the child; (2) a standard chemical solution, usually two per cent silver nitrate, known to kill the gonococcus without injuring the tissues of the eye, if promptly and properly brought in direct contact with the disease-producing organism before it penetrates the eye structures; (3) the presence of a physician or authorized trained nurse or attendant who can administer the prophylactic correctly; (4) the follow-up observations of the physician who can take such further steps as may be necessary if the silver nitrate solution for any reason failed to accomplish its purpose. Thus far science and medicine have not been able to simplify this exacting procedure; because no way has yet been found to fortify the body against attack, or to delay penetration of the tissues by the gonococcus, or to follow it into the structures deeply invaded with any solution which will destroy this pathogenic organism and not harm the body cells with which it comes in contact. Even with these sharp limitations, however, these infections have been very greatly reduced in the past thirty years. Many states have laws requiring the application of this procedure at birth of all children in order to safeguard the unknown number who may have been exposed to this infection and the cruel handicap of blindness, so expensive alike to the individual and the public. Women's organizations, professional, civic and social agencies have worked persistently to secure nation-wide and thorough application of this measure for venereal disease prophylaxis.

In view of such demonstrated popular support of both the theory and practice of prophylaxis in this type of gonococcal infection, and in the light of recent similar approval of safeguarding unborn children from syphilis by treatment of their infected mothers early in pregnancy, it seems incomprehensible to many that so little has been done to apply known prophylactic procedures to adults. The experience of the Army and the Navy has proved that highly satisfactory results can be counted on when the complete program is carried out. Aside from public lack of accurate knowledge, and the popular assumption that adults are responsible for their conduct and deserve no attention because they could have avoided exposure, the chief difficulty in civil life has been and continues to be lack of rigid adherence to the scientific requirements of prophylaxis against exposure during sexual intercourse: (1) preliminary soap and water cleanliness, sometimes supplemented by approved ointments, solutions and jellies when advised by the physician and proper use of approved sheaths (particularly for the male); (2) standard chemical disinfection thoroughly applied within two or three hours after the beginning of exposure; (3) follow-up observation to ensure prompt institution of such additional measures as may be advisable; and (4) early treatment for those cases in which infection was not prevented. Finally, it must be recognized that all these measures are very difficult to apply practically to women.

Pharmaceutical chemists, manufacturers of sheaths of various textures, and of soaps, jellies, ointments and lubricants have been resourceful in their efforts to devise inexpensive methods of meeting the scientific and clinical requirements of this group of prophylactic measures. But only within the limits of (1) supervised prophylactic stations or clinics providing personnel and facilities for promptly administering such treatments, and (2) private practice affording equivalent facilities and supervision, have very encouraging results been attained as yet. Many of the mechanical sheaths available to the public are not impervious, or break during use, do not stand lubrication, are not properly fitted, or are objected to for other reasons. Frequently they are believed to interfere with normal intercourse or completion of the sexual act to the satisfaction of one or both parties. Before health authorities can depend largely on this prophylactic device, ways must be devised to discourage the manufacture, distribution and sale of defective sheaths; and more successful methods of instructing individuals in their proper use must be developed as part only of the whole program for prophylaxis. It may be observed in passing that the use of rubber gloves as one of a series of precautionary measures by the surgeon, dentist and nurse in dealing with infectious cases is, in scientific principle, analagous to what should be taught regarding the proper place of mechanical devices in the prophylaxis of syphilis and gonorrhea. Furthermore, these mechanical devices for use during sexual relations offer no protection against extra genital infectious lesions.

Chemical disinfection immediately following exposure has been similarly open to criticism in civil life because of failure to safeguard users against superficial methods and exploitation by promoters of ineffective chemicals; and because no adequate attempts have been made by health and medical authorities generally to raise these prophylactic procedures to the standard of practice set by scientific requirements. The long list of achievements in applying prophylaxis in other infections proves that physicians, nurses and social workers are not indifferent to the conquest of disease by effective preventive measures, and that health authorities are eager to get results no matter how difficult and exacting the program may be. It seems clear, then, that some other explanation must account for the apparent indifference, superficiality and unscientific attitude of many among the professional groups and laymen toward prophylaxis for these infections.

This explanation may be found partly in the real or imagined conflict between the individual and the community in respect to sexual conduct. Wherever this problem of prophylaxis for syphilis or gonococcal infections has been separated from complicating moral issues, and a scientific, dignified, sympathetic, and thorough prophylactic service has been provided encouraging results have been attained. The United States Army and the Navy, for example, have had a long experience in the practical application of the measures outlined. Wherever the circumstances have been such, that exposure of the men was followed by their reporting within an hour or a very few hours for adequate prophylactic treatment under trained supervision, the results have been highly satisfactory; the follow-up medical observations have shown few infections; and for the most part these have yielded promptly to treatment. However, when it has been necessary to rely upon the men for self-application of prophylactic measures, even though they had received previous instruction, the results have been far from satisfactory. In other words the personal rather than the scientific factors are the basis of many of our difficulties in securing the best results from the prophylactic measures we are discussing. Analyses of these personal factors in army and navy experience show the importance of drunkenness or confusion and irresponsibility due to alcohol, difficulties in reaching the prophylactic station in time, belief that the girl was not infected, desire to conceal the fact of possible exposure, objection to the way in which the prophylactic treatment is administered, and argument that sheaths or prophylactic packets were used and so no other precautions were considered necessary. Briefly the Army procedure is (1) to instruct the men, (2) require reporting to a prophylactic station for treatment promptly after exposure, (3) follow-up observation until the medical officer is assured that infection has not occurred. In addition various measures which we need not discuss here have been employed to impress on the men and officers the importance of prophylaxis and control of the venereal diseases. For example, restriction of liberties, and reduction of pay of the men, using the venereal disease records as a factor in considering efficiency of line officers, as well as medical officers.

The Navy has greater difficulties with which to contend than the Army in this matter. Land stations for supervised prophylaxis within practical limits of time, distance and accessibility after exposure, are often not available. This reduces the possibilities to the use of sheaths, prophylactic packets, and civilian facilities if any are available. The use of the latter by either the Army or Navy present administrative difficulties, and few civilian stations exist. The prophylactic packet, even when chemically acceptable and fresh, requires careful and thorough use promptly after exposure; and many men even when sober and free from emotional excitement fail to understand what is meant by thoroughness and care in a medical sense. They are likely, however, to think they have applied the contents of the packet properly, and generally feel assured that infection will not develop. The sheath has the advantage of being applied before exposure and if properly constructed, well fitted, and removed with adequate care and followed by soap and water cleansing and such supplemental chemical prophylaxis as may be feasible, good results should follow. For these reasons the Navy has tried the addition of this procedure prior to the requirement of reporting to the prophylactic station on return from leave. In France during the war, chemical prophylactic outfits for emergency stations were issued to certain detachments of troops, moving rapidly or temporarily on duty where the regular supervised stations could not be set up. The Canadian military authorities combined the issuance of individual prophylactic packets at the front, with reporting to medical officers in leave areas for final instruction and use of prophylactic stations if exposed. The fact that the venereal diseases rates in the United States Army have dropped from 179.3 in 1909 to 34.4 per 1.000 men in 1934, and that the Navy likewise, for the same period, has succeeded in reducing its rate from 193.5 to 90.2, shows that important influences have been at work. In both these branches of our military service, prophylaxis is credited with a large share in these encouraging results.

The important thing for us to keep in mind, however, is that the group of prophylactic measures we have been discussing in this symposium are only a link in the long chain of measures to which I have alluded. In civil life the thorough use of properly made mechanical and chemical prophylactics on the initiative of an individual may help that individual or may fail and result in his having a false sense of security. The question facing the health officer is: How far may I go in advocating such personal prophylactic measures, without any opportunity to instruct the individual beforehand or to follow him up afterward? In contrast to military experience, civilian prophylactic stations have not been successful in the United States. They have been tried for short periods in many places. Prophylactic packet distribution has been tried even more extensively but adequate data are lacking to show how effective this procedure has been as a public health measure. The experiments of the states of Kentucky and Pennsylvania are best known to the public, because their health departments made serious efforts to educate the public and provide readily accessible standard packets, produced by the state or officially approved; but these in common with other states and cities have failed to develop adequately the plans initiated.

The great increase in the manufacture and sale of mechanical devices used during sexual intercourse, theoretically should have prevented many infections, and may be accomplishing something in this direction, but no convincing data yet exist on this point except for small groups and over short periods of time. And unfortunately even for these groups other measures of education, environmental control, and varying prophylactic procedure are involved. Thus from the health officer's point of view, he can not as yet justify placing his official stamp of approval upon these measures, which paradoxically could be theoretically among the most important in our whole program of combatting syphilis and gonococcal infections if everyone could be counted on to apply them scientifically.

As matters stand today, however, it is essential that the health officer, the physician, and their professional co-workers, receive public support in concentrating their efforts upon finding all infected persons at the beginning of infection, providing prompt treatment, and keeping them under such observation and subsequent care as may be necessary in the public interest. Educational, chemical and mechanical prophylactic measures should, of course, be promoted simultaneously as supplemental but not confusing or alternative measures. What an individual can do with this knowledge may be all important in his case; but the health officer who depends on any considerable number of individuals doing the effective thing runs the great risk of losing the vitally essential opportunity of applying epidemiological and medical measures which are certain to reduce the number of infectious persons in his community and greatly shorten the periods of time for which they remain capable of transmitting infection.

In conclusion it should be said that everything in these comments on prophylaxis as related to syphilis and gonococcal infections has been directed toward establishing a proper place for this group of measures in the entire program against these diseases—not against the measures themselves when scientifically applied. More research, both medical and sociological, is needed, particularly concerning the possibility of effective measures for women. The greatest obstacle encountered in civil life in advocating prophylaxis has been an attitude of indifference or feeling that "these measures are better than nothing," so why not let the men use them. They *are* better than nothing—*so much* better in their scientific possibilities, that they *must* not be discredited by superficial and wrong usage; which unfortunately becomes far worse than nothing—in short, a serious menace to steady advance of the other public health and medical measures which we have learned how to use effectively.

Criteria of Cure of Syphilis*

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THE cure of syphilis implies not only eradication of the disease by complete destruction of all invading organisms, but also the maintenance of a normal healthy state and the preservation of the individual's life expectancy. The means used to determine that a patient has been cured of syphilis are not as concrete as the methods for determining that the patient has the disease. The Wassermann test may be cited as an example illustrating this point: The positive flocculation test has a diagnostic value of 85 per cent; however, a negative test for a patient who is known to have had syphilis has no value as an indicator that the disease has been cured. When endeavoring to establish the presence of cure it is the practice to correlate the negative findings and thus base the impression of cure on negative rather than positive data. Even with the advent of the new flocculation procedures the situation remains about the same, although concepts of the criteria of cure are now more crystallized than they have been heretofore.

It is generally accepted that syphilis is curable and cure may develop spontaneously or may be the result of efficiently administered treatment. The fact that the disease is curable spontaneously has been recognized in numerous individual cases, but Bruusgaard's report was the first one in which a large series of cases observed for a long time presented evidence that eradication of the infection may occur without treatment. The significance of spontaneous cure, however, is questionable, other than that it must be taken into account when appraising the results of any method or system of treatment for syphilis. It especially loses its significance when it is realized that we have no way of determining whether a patient with acute syphilis will rid himself of the disease spontaneously or whether, if left untreated, the condition will run a severe and rapid course. As a result, it is compulsory from the standpoint of public health as well as for the individual's welfare that all patients with acute syphilis be adequately treated. Spontaneous cure is, therefore, admitted as occurring and it is of scientific significance, but from a practical standpoint it is not applicable to the individual case.

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The statistics from recognized clinics in Europe and in this country show that adequate treatment of a group of acute syphilitics results in the cure of from 64 to 88 per cent of them. This variation in the incidence of cure seems to be attributable not alone to the system of treatment employed, but also to the amount and frequency with which drugs are given and to the number of years that the patients have been paroled or observed after the course of treatment is completed. Milian recently reported the cure of 64.8 per cent of a group of 243 patients with acute syphilis who were treated and observed for ten years. Lomholt, citing the results in Denmark, reported cures in 88 per cent of a group of patients who were intensively and persistently treated but were observed for less than five years. The Coöperative Clinical Group[3, 8] in this country noted variation in the incidence of cure depending on the frequency, intensity and regularity with which treatment was given. The continuous system of treatment resulted in cure in 86 per cent of cases, whereas the intermittent type of treatment was successful in 64.5 per cent; the irregular and short intensive methods resulted in cures in 54.7 per cent and 62.5 per cent, respectively. The Coöperative Clinical Group had the opportunity to observe a group of patients who were treated according to good standards at the time and who were observed for periods varying from ten to twenty years; of the eighty-six patients in this group, fifty-four (62.8 per cent) were cured, fourteen (16.2 per cent) had persistently positive Wassermann reactions but no clinical evidence of the disease, whereas the remaining 21 per cent presented clinical evidence of syphilis in one form or another.

A comparison of these reports clearly indicates that the outstanding results in the treatment of acute syphilis are noted among the patients who receive adequate treatment regularly and intensively.[6] Regular treatment consists, as the word implies, of systematic treatment with short rest periods between courses. If the continuous system is used no rest periods are permitted, the course of therapy being a continuous and steady procedure from its inception. Intensive treatment refers to the amount of the drug given, both as to dosage and number of injections. It appears that those patients whose therapeutic program called for a series of approximately forty injections of arsphenamine, with at least twice as many injections of a bismuth or mercury preparation, were rewarded by the highest incidence of cures.

Some rather pertinent comments have recently been made apropos of the treatment of acute syphilis. Zieler (Germany) was of the opinion that if serologic tests are not reversed to negative by the end of the first year of a systematic and regular treatment course, there is small possibility that the patient will be cured. Milian (France) expressed the belief of most syphilotherapists that the highest incidence of cure is noted in those cases in which treatment is started while the condition is in the seronegative chancre stage. Tommasi (Italy), who reported cures in 84 per cent of 875 patients who were well treated, believed that although statistics indicate that cures are produced in a certain percentage of cases, that when we endeavor to determine whether a single given case is going to respond satisfactorily to treatment or when we endeavor to assure a patient with acute syphilis that he will be cured, such statistics are of but slight value. As a result of his own experience, but not from statistics, Tommasi, however, believed that cure is possible in practically all cases in which patients adhere rigidly to a complete therapeutic program.

It seems agreed that acute syphilis is curable in most of the cases in which treatment is started during the early phase of the disease, the earlier the better; but, to be successful, treatment must be given regularly and intensively and without, or at best with only very short, rest periods, and it should be continued for approximately fifteen months. Regularity in the receiving of treatment is essential.

Latent syphilis is that phase of the disease when neither symptoms nor signs are present, when examination of the spinal fluid is negative, and when no evidence of cardiovascular or visceral disease is present. The serologic findings on examination of the blood may be negative or positive, and the disease may be of from two to fifty years' duration. There are two significant features in the question of latent syphilis that should be mentioned in a discussion of the cure of syphilis. The first is that the distinction between serologically negative latent syphilis and cured syphilis is most difficult, because both the latency and the "cure" are determined only after a thorough survey has failed to demonstrate any positive evidence that the disease is active. In other words, these states are both diagnosed by exclusion. As the diagnosis is based solely on negative findings it is, therefore, not absolute. Accordingly the only means we now have at our command of differentiating between latency and cure is by annual re-examination of these patients, essentially for the remainder of their lives.

The second point involves a discussion of biologic versus clinical cure. We are unable today to determine the presence of biologic cure other than at necropsy; the numerous experiments undertaken on laboratory animals in which inoculation of tissue, glandular extracts, and semen from a patient with syphilis have resulted in the production of syphilis in the animal, are tests which demonstrate that the patient is not cured of the disease. A negative inoculation experiment of this type has no value. On the other hand, clinical cure is the end for which the majority of physicians and patients strive and it today must be accepted by both as the practical demonstration that the disease has been permanently controlled.

Another manifestation of syphilis in which a discussion of cure is applicable is asymptomatic neurosyphilis. If treatment results in the complete reversal to negative of the serologic tests on blood and spinal fluid and they remain so after treatment is stopped and no clincal evidence of neurologic involvement is manifested, a patient with asymptomatic neurosyphilis may be classed in the cured group. I found that 80 per cent of these patients were clinically and serologically cured if all the accepted therapeutic procedures were used.

In the various other manifestations of syphilis in which the degree of involvement is mild, or in those in which vital structures are involved, the use of the word "cure" should be avoided and in its place the word "arrested" may be substituted for those patients whose treatment has resulted in the disappearance of the clinical manifestations and reversal of the serologic tests to negative.

Means of Diagnosing Cure of Syphilis

I have already made mention of the fact that we do not have available any tests or procedures on which the diagnosis of cure can be made with certainty. The efforts to establish the fact that the patient has been rid of the infection in reality are efforts to prove that the disease is present and active, and only when these attempts result negatively are we in a position to presume that cure has been accomplished. Among the factors that participate in the estimation of cure the following are worthy of comment: (1) Clinical search for evidence of syphilis; (2) serologic tests; (3) treatment; (4) laboratory evidence of infectiousness; (5) provocative and reactivation tests, and (6) the presence of reinfection or superinfection.

1. *Clinical Search*—A thorough clinical examination of the patient is an essential part of the estimate of cure. Obviously when evidence is present that the central nervous system is involved, or when signs of aortitis are noted or any similar commonly recognizable manifestations of the disease are present, the possibility of cure is dismissed. There are several signs of acquired syphilis which to the uninitiated would be readily overlooked but which, when present, indicate activity of the disease. Findings which are commonly accepted as significant are leukoplakia, in association of atrophy of the tongue, solitary nodular gumma, and Argyll Robertson pupils in association with hyperactive deep reflexes and nerve deafness. The persistence of generalized glandular enlargement is of debatable significance, and spade or arced nails are of slight if any significance. The French attach much weight to the presence of hypertension in a young person if no evidence of renal disease is present; also, if there is enlargement of the liver and spleen they believe active syphilis must be suspected.

2. *Serologic Tests*—A single, negative blood test has no value in the estimate of cure. However, each year thereafter that the patient remains free of symptoms and signs of the disease and the blood and spinal fluid remain negative, each subsequent test that is reported negative gains increasing weight as an indicator of cure. Clinical cure may occur in the presence of positive serologic findings, just as latency may remain asymptomatic, although the serologic tests have not reverted to negative. The persistence of the positive tests, however, requires that at each re-examination especially careful scrutiny must be made for evidence of activity of the disease in the aorta or liver.

3. *Treatment*—Although the amount of treatment a patient has received is not in itself a criterion of cure, knowledge of the amount, system, and intensity of treatment is of value in the appraisal of cure. The appraisal value of this information may be of a negative nature. For example, in a case of syphilis of not more than two years' duration in which the patient has had regular and intensive treatment (fifty injections of arsphenamine and twice as much bismuth) and in which the blood and spinal fluid remain positive, there is small likelihood that complete cure will be produced, as the lack of response to treat-

ment indicates that a virulent type of infection is present. On the other hand, patients are seen who have received but one course of arsphenamine, consisting of six or eight injections, and who yet have permanent, completely negative serologic tests. Accordingly, the response to treatment when the caliber of the treatment is known may be a guide as to the virulency of the disease.

4. *Laboratory Evidence of Infectiousness*—The experimental laboratory does not help in the evaluation of cure. The inoculation of tissue or glandular extracts into animals that result in the development of syphilis in the animal are evidence that cure is not present. When such experiments are negative the test has no value.

5. *Provocative and Reactivation Tests*—The provocative procedure is apparently still used in Europe as an index to cure, while in this country its usefulness has been pretty well discredited. The continental school believe that an estimate of the criteria of cure is incomplete if a provocative procedure has not been done, at the same time they believe that a negative provocative test is not in itself an indication of cure. In my experience[7] the provocative test may be of diagnostic value but is worthless as a criterion of cure. The provocative test is of less value than a series of serologic tests done every day for a period of ten days. The reactivation test as used by Tommasi consists of giving of an inadequate amount of treatment and then observing the patient to note if the disease becomes active. This procedure has but few advocates in this country.

6. *Reinfection or Superinfection*—Theoretically it would seem when a patient acquires a second infection, either from a reinfection or superinfection, that the first infection was cured. Balbi, however, has shown that it is possible to produce a second infection among patients with active signs of late syphilis. In addition, it is difficult to distinguish between relapse and reinfection, the former often masquerading as a new infection. Even when it is possible to establish without controversial doubt that reinfection has taken place, it is not evidence that the first infection was cured; also, the demonstration of reinfection has no practical application and hence is only of scientific interest.

Syphilis is curable either spontaneously or as a result of treatment. The appraisal of cure is applicable only to patients who acquired the infection recently or who have latent syphilis. The criteria of cure consist of repeatedly negative clinical and serologic examinations of patients who have been adequately treated for acute or latent syphilis. Each succeeding year after completion of treatment that these examinations and serologic tests of both blood and spinal fluid remain negative the greater is the likelihood that the patient has been rid of the disease.

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The Treatment and Criteria of Cure of Gonococcal Infections in the Male*

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TO WRITE in an acceptable manner upon the treatment of a disease for which there are almost as many plans of treatment as there are physicians who apply them is in no sense an easy task. While our experiences with the treatment of syphilis at last have put us in a position wherein something like a standard plan can be laid down, the treatment of gonorrhea, largely because we have not given to it the deep thought that we have syphilis, has reached no such ideal a state. Hardly any two of the so-called authorities are in sufficient agreement regarding the why and how of treatment to make even a slight showing of uniformity in method.

Such being the case, one knows before he writes on the treatment of gonorrhea that there will be many with dissenting opinions on almost every view he takes. Of course, much of this variance of opinion is of a trivial nature, but it unfortunately adds to the general confusion and leads to a state of mind wherein authors feel it necessary to mention almost every plan of treatment good or bad that seems to have gained any great degree of usage in the last few decades. Hence, much of the writing upon the subject abounds in *what* and *how* and shows a great dearth of *why*.

Just why gonorrhea should be the one disease about which this can be said can be answered in many ways, none of which are complimentary to our science. No doctor treats typhoid, pneumonia, diphtheria or any other disease without a consideration of the principles underlying both the disease and the therapy of it. And yet, the treatment of gonorrhea often is carried out in the most routine of ways, with seldom a thought as to why tnis or that plan is in no way appropriate for such a disease or the present stage of that disease. How many disease transferences, prolonged attacks and complications are due to this cannot be computed, but it is a very heavy human cost.

Thus the request that I write upon the treatment of gonorrhea in this symposium finds me with deep conviction that there is even a greater need to clarify the general understanding of the underlying factors of gonococcal infections and the treatment indications they put forth than there is for a long dissertation upon treatment alone. The limitations of space preclude such a possibility and I shall have to confine myself to the briefest discussion of the aims of treatment.

To one who knows gonorrhea clinically it is obvious that in its treatment we are trying to bring about a more ready curative response in an individual who eventually would get well if he refrained from those things known to prevent cure though he received no treatment whatever. We are not trying to kill gonococci but to encourage his combative processes to kill them. It is the realization of the difference between these views that makes the line of demarcation between the old and new, between confusion and clear thinking.

As one visualizes the anatomical and histological structure of the male urogenital tract from the standpoints of susceptibility, disease habits and the necessity for drainage he should not need years of clinical experience to convince him that trauma of any sort is inimical to mildness of course, freedom from complications and prompt cure. Thus he who contemplates the treatment of patients with this disease should judge every procedure by its possibility for harm and, if it has such, he should refrain from using it regardless of who may be its advocate. Also, he should keep constantly reminding his patients that any form of sexual excitement and any type of alcoholic drink always prevents cure and that long automobile rides, excessive physical exertion commonly do. It might be added that one who sleeps with one of the opposite sex rarely has a mild attack of the disease.

Years of observation and experience have proved that the applications, in a nontraumatic way, of mildly stimulating solutions to gonorrheal mucous membranes enhance their curative efforts. It is equally true that the sooner these are resorted to the milder the disease course, as a rule. The longer they are delayed the surer is the patient to have his disease extend into the posterior urethra. (Eighty-five per cent of co-operative patients treated before the sixth day escaped posterior involvement and of 183 cases seen after the sixth day only two escaped such disease extension. Venereal Disease Information, September, 1934.)

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Reduced to its simplest factors, then, the treatment of gonorrhea is a matter of patient control to the end that he does not indulge in those things known to prevent cure; the gentle use of local treatments to the infected membrane wherever possible and whenever safe; the education of the patient regarding those things he may do that cause complications; the avoidance of treatment methods of a sort or at a time when they could do harm; the realization that every posterior case has an infected prostate in which drainage must be promoted when safe to do so; the refusal to dismiss patients as cured unless every effort has been made to stir possible infection into activity.

Unfortunately, we seem to have developed no reliable short cuts to cure. Artificial, prolonged temperature elevations are not always safe, are not always curative, and certainly do not lend themselves to the treatment of any great numbers of patients. They are still in the experimental stage in which reports of different workers are widely at variance. There, however, seems to be considerable agreement regarding their beneficial action on some complications, notably gonorrheal arthritis.

Oral medication has practically nothing to recommend it from a curative standpoint despite the glowing advertisements in many of our journals.

Biological products can be placed largely in the same category. They either are too dangerous for a disease with such a narrow margin of immunological safety or they lack safe curative value. This does not, in the experience of my associates and myself, except the various newer filtrates. At least we have been utterly unable after careful trial to demonstrate any therapeutic value in them and have seen them do great harm.

Diet, other than the abolition of alcohol, needs no curtailment. The patient safely can eat what he wants. The use of catheters or other instruments in a gonorrheal urethra is, in my experience, a gross treatment fault. The idea that they promote drainage from smaller mucous channels is probably not true in either theory or fact, and it is far outweighed by their potential harm. The response to gonococcal infection is the outpouring of polymorphonuclear leukocytes, while the response to trauma is round-cell infiltration. Strictures are formed by the inherent quality of round-cell infiltrates to become fibrous tissue.

The disease, from the point of treatment indications, lends itself to division into three stages, viz: Anterior, acute antero-posterior and subacute or chronic antero-posterior. And the treatment indications vary in each.

As cases of anterior urethritis in which only the anterior urethra is involved carry a minimum of complications and usually are well in from six to eight weeks, the great aim is to avoid posterior infection. As can be seen from the previously quoted figures, this rarely is possible unless local treatments are begun by the fifth day of the disease. To withhold them because the case shows pronounced inflammatory evidences is a mistake, the treatment usually obliterates these within forty-eight hours.

With the statement that a large assortment of mild chemicals brings about the amount of mucosal stimulation required (Protargol ¼-½%, 1/3,000 Neutral Acriflavine, Argyrol 5%, Neosilvol 10%, potassium permanganate 1/5,000 to 1/3,000, silver nitrate 1/10,000 & c. & c.) I shall shorten matters by detailing briefly the exact method I use in my office, the plan giving the results previously recorded.

The anterior urethra is gently washed out, under such low hydrostatic pressure that none of the fluid is forced into the posterior urethra, with 1/8,000 potassium permanganate solution. This is allowed to drain out and not more than six c.c. of five per cent silver nucleinate solution is injected into the urethra by means of a rubber bulb syringe. A piece of absorbent cotton two by six inches is placed over the glans penis and the fluid held in by a penis clamp for from five to ten minutes depending upon the discomfort it occasions.

After this the fluid is allowed to escape and the clothes protected by a similar piece of cotton held on by two No. 10 rubber bands. The patient is instructed to replace the dressing after his first urination but not after the second as the constriction of the bands may check proper drainage.

These treatments are given daily until there is no urethral discharge between then and the first glass of urine is almost clear. This is in most favorable cases two weeks, in others three weeks. The treatments then are spaced at forty-eight hour intervals for two weeks and at seventy-two hours for the succeeding week. If, by the end of this time there are no signs of disease and there has been no discharge for the last two weeks or more the so-called proofs of cure are resorted to.

If things are not going satisfactorily during the first two weeks, two treatments a day are resorted to. If it is not possible for me to meet the patient twice he is given some 0.5 per cent protargol, a one drachm urethral syringe and instructed to give himself an injection at night, immediately after urination, and hold it in five minutes by the clock.

If it is impossible for the patient to visit the office daily he is told to use his injection twice a day. Such patients rarely do so well as the others, but many of them escape posterior infection. They, however, rarely are well in less than eight weeks.

If the urethral discharge continues and the first glass of urine is cloudy until the tenth day, seemingly nothing will prevent posterior extension.

During the entire treatment the patient is kept interested in the appearance of his urine and is constantly reminded that he cannot expect good results if he has any alcoholic drinks or sexual excitement. He is told that the job of getting well is his and the job of helping him to do so more quickly and safely is his physician's. Understanding these things makes him more careful of his conduct and less prone to criticize.

Acute Antero-posterior Infection

When gonorrhea first involves the posterior urethra and trigone the therapeutic indications undergo a complete change. Anterior urethral treatments may be continued for the sole purpose of limiting the annoying urethral discharge but they are in no sense curative. It is the consensus of opinion that direct treatments to the posterior urethra during the early stages of its infection are far too hazardous from the standpoint of the complications they may precipitate to make them advisable. The fact that many of those cases that have a posterior infection after having the treatment previously described have almost an asymptomatic posterior extension should not be used as an excuse for ignoring this "hands off" policy.

Oral sedatives, limitation of physical activity and hot sitz-baths once or twice a day are safer than local meddling until such time as the posterior activity subsides.

It is my opinion that at least two weeks should elapse in any case before efforts are made to introduce solutions into the bladder. In some patients it is best to wait even a longer time as it is not wise to irrigate until bladder comfort entirely has been regained.

Sub-acute Antero-posterior Urethritis

When safe to do so the bladder is washed out with 1/8,000 potassium permanganate solution by the use of not more than three and one-half feet of hydrostatic pressure. With the irrigating nozzle firmly pressed against the external urinary meatus, the patient is instructed to relax as though urinating and a few ounces of fluid is allowed to flow into the bladder. This is voided and the procedure repeated several times, never really distending the bladder, and some of the solution is allowed to remain at the end of the treatment. In some patients difficulty is experienced in relaxing the sphincter. The less fuss made about the treatment the more rarely this will happen. If not successful it is better to try next time than to raise the pressure sufficiently to force the sphincter.

These irrigations are carried out two or three times a week until the first glass of urine contains only a few shreds when the very gentlest type of prostatic stroking is done, the patient then being told to pass some of the solution previously left in his bladder to flush the urethra and reduce the liability of an increase of urethral discharge as the result of the action of gonococcal products expressed from the gland. If such a treatment does cause discharge or the clouding of the first glass of urine which persists until time for the next treatment the irrigation is carried out but the massage is not.

When several prostatic treatments have shown that massage is a safe procedure, pressure on the gland is increased gradually at each treatment until it is that of the usual routine degree. It should thereafter be moderately firm but not to the point of real pain and it should not be done oftener than twice a week. Prostatic treatments should be continued until the gland secretion is free of pus but it is well after a month or so of prostatic treatments to discontinue the irrigations if one would have the urine shred-free when the gland is well.

It should be borne in mind that some patients have prostatitis of focal infective origin before the gonorrhea is acquired and that the infected teeth or tonsils to which it usually is secondary must be attended to if the gland is to be rendered pus-free. Thus, if treatment is not reducing the number of pus cells in a postgonorrheal prostatitis, it is wise to investigate both teeth and tonsils.

Rarely can one find the gonococcus in the obtainable secretion after six weeks of prostatic treatment twice a week. The possibility of their being there, however, should not be overlooked, for in some cases they are. Hence, the importance of not dismissing patients until the prostatic secretion is normal and tests for cure have proved negative. It is, of course, recognized that some focal infective prostates are rather difficult to bring to this stage. The same does not apply to the truly postgonorrheal prostatic infection wherein there has been no abscess formation, for with careful treatment, practically all of them should be rendered pus-free in from two and one-half to three months of properly done and properly spaced prostatic treatments.

A word about the supposed frequent association of gonorrheal seminal vesiculitis and gonorrheal prostatitis before proceeding to a discussion upon criteria of cure. Years of very close observation and study upon this question convince me beyond any doubt whatever that gonorrheal seminal vesiculitis does not occur in more than two per cent of the cases of gonorrhea. I have discussed this matter thoroughly in other places and shall confine myself here to the statement that if gonorrhea does involve a seminal vesical and the vesicle is closed so that drainage cannot possibly take place the infection will disappear spontaneously and need not be considered in the general clinical picture. If, on the other hand, the vesicle can empty itself the patient will have a definite increase in discharge within twelve hours of every seminal emission, he cannot fail to do so. Such a clinical occurrence far outweighs in diagnostic value the highly misleading palpation of the vesicle and all other diagnostic signs. Such a reaction following seminal emissions is not encountered in more than two out of every hundred cases. Rarely have I seen it in patients who were co-operative and were carefully treated from the early days of the disease. Usually it is found in patients seen late in the disease, patients who have done all of those things forbidden and who have had an assortment of traumatic treatment efforts carried out.

When a patient proves by his reactions that the vesicle is infected it is well not only carefully to strip the vesicles at the time of prostatic massage but to even do so between these periods. In other words, empty the vesicles every other day to avoid the accumulation of large quantities of gonotoxin to cause a profound urethral reaction when stripping is done. Under this plan it usually is possible to eradicate the infection in both prostate and vesicles in little more time than is needed for the prostate alone. Vesicular stripping at greater intervals is not attended with such prompt improvement.

The patient who gets no recrudescence of urethral discharge after a nocturnal emission has no seminal vesicular gonorrhea, nor does he need any treatment to his seminal vesicles.

"Our Criteria of Cure"

All of our so-called "proofs of cure" are based upon the fortunate fact that quiescent gonococcal infections can be stirred into activity by one or several things, an activity wherein it should be possible by careful microscopy to demonstrate the presence of the gonococcus. But let us not mislead ourselves by that word "proofs," for just because the gonococcus could be found if one tried hard enough is in no sense a proof of cure if one does not find it.

At best our proofs are merely inferences. We have no absolute "proof of cure" except the fact that the patient can indulge in the drinking of alcoholic liquors and sexual intercourse repeatedly without having an urethral discharge containing the gonococcus. For certainly no gonorrhea in the male can lie entirely dormant under such Neisserian insults. And just as certainly we cannot advise patients to indulge in sex outlets as the first steps toward proving that they do not develop a discharge after them. I have no belief whatever in the widespread opinion that gonorrhea can lie absolutely dormant in the male and then suddenly awaken into activity. To me it is a biological impossibility despite the plausible reports of such cases in the literature. I have unmasked too many dozens of them to believe that the reporting doctor has not been fooled.

If a gonococcal focus drains, it does so into the urethra and from time to time it causes a discharge of which the patient is conscious. Careful study will reveal the gonococcus. If the focus cannot drain it cannot persist, it cures itself as previously has been cited.

To shorten discussion let me fall back on a description of my own way of trying to find the gonococcus if present.

In anterior cases the prostatic secretion is studied to make sure that a possible posterior extension has not been overlooked. A bulbar sound as large as the external meatus will permit is passed backward and forward between the meatus and the cutoff muscle (never through it) in such a way as to make considerable pressure upon the floor and roof of the canal where the glands and crypts are located. The patient is given glass slides, instructed how to make thin smears and told to bring in a smear of any discharge he can strip from the urethra.

If no discharge has appeared, Cowper's glands are squeezed between the thumb and finger, the urethra is digitally stripped throughout its entirety and the patient instructed to pass a small quantity of urine in a glass. This urine is centrifuged, the sediment is washed with water and again sedimented. After this no difficulty is encountered in smearing the sediment and having it adhere to the glass slide.

Failing to find gonococci, a sound is passed to the cutoff muscle and the entire anterior urethra is firmly massaged upon it. Again the patient is given slides and instructed to bring in a smear of any discharge that may appear.

Responding negatively to this he is instructed to drink either beer or other alcoholic liquor, to indulge in sexual excitement but not intercourse and try to obtain a smear the next morning.

Almost without exception (one in twenty-five years) the patient who develops no discharge after these efforts will hear no more from his gonorrhea. To tell him that he is well, however, is to lose sight of that one exception. The nearest I ever let myself come to that is to inform him that, having responded negatively to the usual tests of cure, it is probable he is well but he has not been proved so. The gonococcus is a very small thing and the fact that it was not found does not positively prove it is not there, wherefore, he must not place his organ in contact with a female mucous membrane for three months without the use of a rubber condom that he has proved is intact. Of course, few exercise the precaution that long but as I have never seen a gonorrhea fail to become active by the third intercourse, I have no fear for the safety of his subsequent enamorata.

While I do not make use of vaccines as proofs of cure, there is no valid reason why they should not be used provided they are the last things used. To start with vaccines is an error, for if one does get a recrudescence of symptoms in this way it is a far more difficult thing to clear up than are the discharges that may be occasioned by the above-mentioned procedures.

In the male, compliment fixation tests are of little value as immediate proofs of cure. If the test has been positive it often remains so for months and patients find the wait a tedious one.

The only difference in procedure in the posterior case that has been treated until the prostatic secretion is normal is that the sounds are passed into the bladder instead of being stopped at the cut-off muscle.

Cultural methods have been of no use to me whatever. The peculiar behavior of the staphylococcus and the streptococcus upon the enriched media required for gonococcal culture is more likely to mislead than help. In my mind this is well shown by the weird and utterly impossible writings from Central Europe on spermoculture. When and if the time arrives that someone finds a way to keep the staphylococcus, that is always present in the urethra, and the streptococcus which often is, from developing upon enriched media Gram negative diplococcal forms that cannot possibly be differentiated from the gonococcus, I may have more confidence in cultural methods as evidences of cure. There are few more difficult bacteriological procedures than the isolation of the gonococcus from an admixture of staphylococci and streptococci and the proof that it is a gonococcus.

The Role of the Private Physician in the Control of Venereal Diseases*

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THE principle is generally accepted that a reduction in the incidence of venereal diseases in any community depends largely upon the provision of adequate treatment facilities and their utilization by infected persons. There is still considerable difference of opinion, however, concerning the stress which should be laid upon the various types of treatment facilities which are available to the public. Most of the emphasis both in this country and abroad has thus far been laid upon expanding and improving the free clinics of public hospitals and upon establishing supplementary health department clinics in those areas in which an adequate hospital clinic does not exist. Voluntary hospitals are also being persuaded to take a share of the public burden although many of them are limiting their services to patients who can afford to pay something for their treatment.

Clinic activities can reach only a minority of the infected persons in the community. It is safe to estimate that at least 60 per cent of all persons infected with venereal disease go first to a private physician for treatment. The effectiveness of any comprehensive plan for venereal disease control will, therefore, depend in a very large measure upon how adequately the program is directed at this part of the population. They can be reached to some extent by an intensive program of public re-education concerning the prevalence of the venereal diseases, their prevention, and more especially, the necessity for continuous treatment. But the majority can be reached only through the private physicians to whom they first apply for treatment.

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It is, therefore, necessary to direct much of the educational resources of the health department directly to the physicians themselves. They must all be enlisted as active and sympathetic workers in the program of venereal disease control so that each one will come to regard himself as a field worker in the public health service. As with all other infectious diseases, the physician must assume the attitude that he is personally responsible for the spread of any venereal disease infections which come to his notice. Each infected person, at the first visit, should, therefore, receive careful instructions from him concerning the nature of the disease and the amount of treatment which will be required to prevent its spread to others.

Careful, confidential inquiries should be made in each instance in order to discover the original source of the infection, just as in cases of tuberculosis or typhoid fever or smallpox. Physicians vary greatly in the skill and the technique required to persuade a patient to disclose the details concerning the source of his or her infection. The efficiency of a private physician, like that of a public clinic, should be judged not alone by the accuracy of his technique in administering treatment, but in large part by his ability to discover the contacts which are the primary or the secondary sources of the spreading infection. This idea cannot be "put across" by talks at medical meetings and by publications which may reach the physician's desk. Direct personal contact must be established periodically between a responsible well-informed and tactful member of the health department and every practicing physician in the community who treats venereal disease. The department of health can do no more effective service in any branch of its activity than by visiting these physicians in their own offices and enlisting them as deputy public health officers.

Many physicians are still unaware of the recent advances in therapy both for syphilis and gonorrhea. The experiences of the co-operative clinical group in the treatment of syphilis and the newer therapeutic measures for the elimination of gonococcal infections should be brought to their attention, not alone at medical society meetings and in publications which reach their desk, but by direct contact between them and some agency of the health department. A minimum standard of treatment should be determined by the best authorities and physicians should be persuaded to administer treatment in an approved manner.

Consultation services are now supplied to physicians by the health department without charge in order to assist them in making early diagnoses. Experienced consultants should also be available, to give them the benefit of advice and guidance in instances in which the elimination of infection proves to be unusually difficult.

If a patient's financial resources do not permit him to continue private treatment, the physician who is willing to treat him for a reduced fee should receive an adequate amount of the therapeutic material from the health department free of charge. If, in spite of careful instruction and efficient medical therapy, a patient discontinues treatment before the termination of the infectious period of the disease, it should be regarded as a proper function of the health department to provide the private physician, at his request, with public health nurses. They should serve under his direction to assist him in discovering contacts and in persuading delinquent patients to resume treatment.

In order to be sure that every patient continues treatment until the infection is eliminated and he or she is no longer a menace to the community, some sort of registration is essential. It has been demonstrated abroad that effective registration can be established without violating the confidential relationship between doctor and patient. If registration by initials and date of birth is accepted as adequate, physicians will not hesitate to report their private cases. The actual name and address need not be disclosed unless a patient wilfully discontinues his treatment and exposes other persons in the community to his infection.

Clinics should persuade all patients who can afford to pay a physician to return to their family doctor. However, if a patient can, but will not pay for private treatment, free treatment should be available to him in a public clinic. The protection of the public health is a community responsibility, like public education. A patient with any dangerous infectious disease, scarlet fever, typhoid fever or a venereal infection, should have his choice of providing himself with adequate private treatment or receiving it at the hands of a public agency such as the department of health or the department of hospitals. In all other respects, the department of health should assist the physician in retaining his private patients and in caring for them adequately.

It is most important that the attitude of the health department toward private physicians should always be one of collaboration and mutual assistance. Persuasion is much more effective than compulsion and, in the end, much more economical. The creation of an efficient registration and follow-up of infected persons who discontinue treatment, will depend upon the establishment of such a co-operative relationship between the health department and the private physician of the community. Physicians will gladly collaborate in any reasonable plan which will preserve the established confidential relationship between doctor and patient and encourage infected persons to continue treatment until cured.

Blood Changes in Exercise*

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THE MANY functions of the blood and its complex nature render it susceptible to gross changes during exercise. Some of these will be referred to briefly; these include the morphological changes, and variations in blood sugar. Modifications due to respiratory changes and to anaerobic metabolism in the tissues will be considered in more detail.

Edwards and Wood[1] have made a study of the leucocytosis of exercise. These studies on football players were carried out chiefly on Saturday evenings in our laboratory, when Wood was leading a dual life as captain of the football team and as a research student in pre-medical sciences. They found that hard muscular work is accompanied by a leucocytosis which may be as great as 200 or even 300 per cent, the rise depending on duration and intensity of the work. The first stage may be lymphocytosis but this may be followed by a polynuclear stage. There may be no drop for two hours after a game and recovery may not be complete for several hours. The picture so closely resembles that of appendicitis that mistakes in diagnosis are possible.

It is well known that there is an increase in red cell count during and after exercise. This is usually of the order of 5 to 10 per cent. The evidence indicates that it arises largely from a movement of water from the blood to tissues consequent upon an increased osmotic pressure in the latter. The spleen may also play a rôle, although not an essential one, for we have found that splenectomized men show about the same increase as normal men in exercise.

The response of blood sugar concentration to increase in metabolic rate has been studied on numerous occasions. The results have sometimes appeared to be conflicting, but when the duration and intensity of the work as well as the nutritional and emotional state of the subject are taken into account facts which appeared to conflict fit into an understandable pattern. In exercise which can be carried on aerobically[2] there is a remarkable balance between glucose utilization and its formation from glycogen stores. The evidence for this is derived from measurements of the respiratory quotients which show a relative increase in carbohydrate utilization as work increases in intensity, and of blood sugar which, despite the acceleration in glucose utilization, tends to remain constant.

Blood sugar tends to increase during exercise which borders on the anaerobic. Despite the maximal utilization of glucose, the rate of glucogenesis may be even higher. The circumstances in which increase in blood sugar is maximal include (a) abundant reserve of carbohydrate and (b) heavy and intermittent exercise with emotional stress. This condition is seen in football players; as shown by Edwards, Richards and Dill,[3] there may be a two-fold increase during the game.

Blood sugar may decrease in exercise carried on long enough to reduce carbohydrate stores to a low level. The most notable example of this is in marathon runners; Best and Partridge[4] found several cases of profound hypoglycemia among men who finished the marathon at Amsterdam. The past spring we made studies of 45 men who finished the marathon at Boston. We consider it notable that the winner had one of the

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highest blood sugars, that the men who finished 1, 2, 4 and 5 had blood sugars above 100, while only 5 of the next 25 men studied had values above 100. There are many other determining factors than carbohydrate reserves, but certainly this is one of the most important in strenuous exercise of long duration. Recognition of this fact has led to an increased proportion of carbohydrate in the diet and to the use of glucose before and even during the race.

Moderate exercise is paid for by the oxidation of carbohydrate and fat and does not involve the accumulation of lactic acid. For every individual there is a critical intensity of work above which lactic acid accumulates—a sign that the supply of oxygen to some muscles is deficient. The level of lactic acid reached in hard work depends on the physical state of the subject. This was illustrated by Dill, Talbott and Edwards[5] several years ago; a grade of work which exhausted some individuals, resulting in a considerable increase in lactic acid, was below the critical level for the marathon runner. The poorest subject in this test and another man who was poorest in a similar test made earlier by Bock and associates[6] have both since died of tuberculosis.

Up to this point variations between arterial and venous blood have been neglected; we now propose to turn to a consideration of the respiratory changes in the blood in recovery from brief severe exercise roughly like that involved in running a quarter mile. Our subject in this experiment ran to complete exhaustion in 71 seconds and then jumped from the treadmill to a bed. Punctures of the femoral artery, femoral vein and antecubital vein were made as soon as possible. The needles were left in place and by changing syringes three series of samples were obtained during the first six minutes of recovery. It was then necessary to withdraw the needles because of clotting, but at intervals during the hour some additional samples were drawn in order to obtain a complete picture of the recovery processes. The blood samples were transferred to tubes under oil and treated with heparin to prevent clotting. As quickly as possible, determinations were made of CO_2 and O_2 content, pH and lactic acid.

The CO_2 content shows extraordinary changes in the early stages of recovery. In the artery the content has dropped to one-half the rest level and reaches a minimum 4 minutes after the end of work. In the femoral vein the CO_2 content of the first samples, obtained about ½ minute after work, is about the same as during rest. There is an exceedingly rapid drop during the early stage of recovery. This suggests that if one were able to draw blood from the femoral vein as work ends it might have a greater content than during rest. These findings are highly suggestive; possibly one of the limiting factors in anaerobic activity is the rate at which CO_2 can be transported from the tissues.

As already suggested, lactic acid accumulates in the muscle in anaerobic work and diffuses very rapidly into the blood. Its speed of diffusion is indicated by the very small gradient between blood in the femoral vein and the artery. This means that there is no rapid rate of removal of lactic acid from the blood in other parts of the body. There is a large decrease in concentration as the blood passes through the arm because idle tissues act as a sink for lactic acid. At first sight these two statements may seem contradictory, but in fact they are not: the point is that in the early stage of recovery the rate of flow to the arms and other peripheral areas is slow so that large gradients of lactic acid, CO_2 and O_2 are possible. That there is an extremely rapid rate of flow through the legs is shown by the small gradient in oxygen content between the artery and vein despite the high metabolism.

We have been taught that the oxidative removal of lactic acid is an important element in recovery from severe muscular exercise. It is disquieting therefore to find that the lactic acid concentration in both arterial and venous blood increases as much as 50 per cent during recovery, reaching a maximum value about six minutes after work stops. It is hardly possible that this phenomenon can be explained by failure of lactic acid to diffuse from the tissues; it is probable that the changes in the muscle are roughly parallel to those in the blood. Our interpretation of these facts is as follows:

(a) At the end of work the oxygen debt, which may be represented by D, is maximal.

(b) According to the nomenclature of Margaria, Edwards and Dill[7] the part of this debt due to accumulation of lactic acid is called lactacid and may be designated by L.

(c) The remainder of the debt, probably in large part due to phosphocreatine breakdown is called alactacid and may be designated by A. At any given time $L + A = D$.

(d) The payment of the debt in the early stage is rapid, one-half being paid in five or six minutes, and then slow, more than an hour being required for payment of the remainder.

(e) At the end of work D may be taken as

100, L as 35 and A as 65. When recovery is one-half complete L = 50 and A = 0. In other words, the alactacid debt is paid in part oxidatively and in part by conversion to lactacid debt.

These increases in lactic acid create a type of acidosis similar in one respect to that in diabetic coma, where accumulation of acetoacetic and hydroxybutyric acid has occurred. The reaction of the blood is much more acid for the reason that in addition to the accumulation of fixed acid, there is temporarily a retention of carbonic acid. Thus the first sample of blood from the femoral vein had a pH of 6.78 by the glass electrode and a carbon dioxide pressure of 150 mm. The nearest approach is a value of 6.95 observed by Laug[8] in the arm vein after running a quarter-mile. So far as we know, this *p*H of 6.78 is the most acid reaction that has ever been found in human blood in vivo, whether normal or pathological. It is not unlikely that blood in the femoral vein at the instant work stopped was even more acid.

These observations throw some light on the nature of exhaustion in short periods of intense exertion. It is characterized by deficiency of oxygen, accumulation of fixed acid and of carbonic acid, and an associated degree of acidity not encountered in pathological states. We venture to state that one of the limiting factors in such activity is the rate of removal of carbon dioxide from the tissues. The respiratory mechanism is faced with the problem of transporting to the lungs not only the CO_2 produced by oxidative processes raised to their maximal level but also of a large quantity released by the accumulation of lactic acid. Inability to keep pace with these two processes leads to an extremely acid reaction and breakdown.

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Tuberculosis and Physical Activity*

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THE INTELLIGENT consideration of the subject "Tuberculosis and Physical Activity" is dependent on our knowledge of the tuberculosis problem, the types of tuberculosis, and methods necessary for early discovery.

As concerns the problem it is apparent from statistical evidence that diagnosis of tuberculosis in the minimal stage is not the rule. Probably our mental habits in the past are partly responsible. Because things in our minds tend to become what they are named, names at times assume undue importance. The words phthisis and consumption are examples. For centuries we have associated the disease with its more advanced stages,—when symptoms have made their appearance. That this manner of thinking has not been conducive to the making of early diagnoses is borne out by the figures of Whitney.[1] Of all cases admitted to 247 United States sanatoria in 1931, only 16 per cent were in the minimal stage; 30 per cent were moderately advanced; and 54 per cent were far advanced. Since according to the Trudeau Sanatorium[2] experience only 10 per cent of the minimal cases are dead of tuberculosis after fifteen years, compared to 27 per cent in the moderately advanced and 54 per cent in the far advanced, the importance of early diagnosis as concerns prognosis is at once manifest.

Why only 16 per cent are admitted in the minimal stage when the prognosis is good and 54 per cent are admitted in the far advanced stage, can probably best be explained by the fact that in the minimal stage, the disease is usually without symptoms or physical signs. In the future, therefore, to discover the condition early we should think of the possible occurrence of active tuberculosis in all those infected.

It becomes apparent that our first problem as concerns physical activity is to determine the status of the individual's lungs. Formerly dependence was made upon the physical examination. Today we know how far short this method falls in finding early disease.

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Fortunately, in the last few years many colleges throughout the country have instituted programs for tuberculin testing all newly enrolled students. Those showing positive reactions are further studied by means of roentgenograms. To make the program complete those having been infected should receive a roentgenogram or fluoroscopic examination of their lungs every six to twelve months, and more frequently where a definite infiltration exists. At Wisconsin we have found the fluoroscope an economically practical means for finding early lesions. When on fluoroscopic examination an infiltration is found or there is doubt relative to a shadow, a roentgenogram is requested before a diagnosis is made. In the individual of heavy proportions examination with the fluoroscope has its limitations, and dependence on the film is necessary. A Coolidge fine focus watercooled tube and Patterson "B" type screen are used. Students having a negative Mantoux test should be retested at least once a year, and on becoming infected should receive a roentgenogram and be re-examined at regular intervals. With such a program we are beginning to learn something about tuberculosis in its earlier stages.

Distinction should be made between childhood or primary and adult or post primary type of tuberculosis. All individuals showing positive Mantoux tests have had childhood or primary tuberculosis, but visible evidence of it may be lacking. Presence of calcified nodules and glands is evidence of the earlier tuberculous pneumonic process with involvement of the adjacent glands. Usually it occurs without symptoms or physical signs — only 5 per cent is progressive — and whether it immunizes or increases susceptibility to subsequent infection cannot be answered. From a practical standpoint until more is known regarding immunity and allergy, efforts should be directed to reduce infection in so far as possible.

Adult tuberculosis differs from the primary or childhood type in that the disease becomes fixed or localized in the lungs without involvement of the lymph glands. It is more serious because it is frequently progressive, causing destruction of the lung tissue with subsequent cavity formation and fibrosis, and usually requires a long period of treatment.

Where an infiltration of a probable tuberculous nature has been found, the amount of physical activity permitted is dependent on the physician's judgment as to how activity will effect the disease process found in the lungs. We have not seriously considered primary or childhood tuberculosis, as regards treatment or limitation of physical activity, for in only one instance has the post primary or adult type developed—the incidence being less than in those showing no evidence of their first infection. As regards adult tuberculosis judgment should be deferred until complete study of the lesion in question is made. Not infrequently all studies done may show normal variations, though the serial roentgenograms will show that the lesion is progressive. Rest being the basis for treatment of pulmonary tuberculosis, it is obvious that regardless of the fact that the patient appears well, has gained weight, has a normal pulse and temperature, has a normal blood count and blood sedimentation rate, where the lesion shows spread on the X-ray film, physical activity should not be allowed or be limited to a minimum. Where the diseased lung has been placed at rest by mechanical means, as by pneumothorax or phrenic nerve interruption, gradual increase of activity after a period of bed rest may be permitted. Because tuberculosis is not alone a local, but a constitutional disease as well, it may be questioned whether rest of the entire body when compression treatment is first begun is not as important as the localized rest of the lung produced by the pneumothorax. Many believe it is. Of course, because of economic reasons, all individuals cannot have bed rest with institution of their pneumothorax. Suffice it to say that though localized rest by pneumothorax may permit greater activity, it does not give complete assurance that constitutional rest may not also be necessary.

Mention should be made of the necessity for re-examination of Mantoux positive individuals at regular intervals. A negative film on admission to school does not indicate that this circumstance will persist throughout the individual's school years. The necessity for continued observation can best be illustrated by case presentations.

Case No. 80551, J. F., a boy, age 19, entered the University in September of 1933. He had a Mantoux test which was one plus to one-tenth milligram of Saranac Lake Laboratory Old Tuberculin. There was no history of tuberculosis in the family; his weight was 125 pounds. Physical examination showed nothing pertinent. X-ray of his lungs showed minimal bilateral apical infiltration, sometimes described as apical caps. In February of 1934 another X-ray of his lungs was requested and no change was noted. His weight at that time was 130 pounds. On January 14, 1935, he was asked to return for fluoroscopic examination. His weight was now 138 pounds, and he stated that he was feeling well. Fluoroscopic examination showed an infiltration confined chiefly to the right first anterior interspace with some extension to the apex. Further study revealed a normal blood sedimentation rate, and the differential blood count showed 12,700 leukocytes with 73 per cent polymorphonuclears and 27 per cent lymphocytes. The X-ray film verified the fluoroscopic findings. Physical examination failed to reveal any evidence of the infiltration. It is interesting to note the absence of symptoms and the weight gain with the development of a progressive tuberculous lesion.

Case No. 79722, W. J. P., a male, age 21, weight 165 pounds, entered the University in September of 1933. He gave a history of having had pleurisy in 1931 accompanied with a high fever, which necessitated his remaining in bed for five weeks. No fluid was withdrawn from his thorax, and he was not told whether an effusion was present. His tuberculin test was one plus to one-tenth milligram of Saranac Lake Laboratory Old Tuberculin. Physical examination of the lungs on admission to school showed nothing pertinent. A roentgenogram of the lungs showed obliteration of the left sulcus, and a rather dense small infiltration at the extreme left apex which did not appear of recent order. He was reexamined in February, 1934, and no change was noted on the X-ray film. In January, 1935, he reported for a physical examination to determine whether he was fit to take part in intercollegiate boxing. On physical examination he was passed as being fit and boxed very well in his bouts. The latter part of February, 1935, he was requested to report for fluoroscopic examination which showed a fan-shaped infiltration at the level of the first left rib and interspace and which was connected with the hilum by increased trunk shadows. Further study done in the University Infirmary showed the gastric contents to be negative for acid fast bacilli. The sputum was likewise negative. The blood sedimentation and differential blood count were normal. His weight was 170 pounds. Physical examination of his lungs showed nothing pertinent. On withdrawing from school he was placed on bed rest at home, and the infiltration showed rapid clearing. He is now attending the University of Arizona. As regards this case, two points should be emphasized. First, the inadequacy of a history of symptoms and physical examination to determine the status of an individual's lungs; and, second, that the lesion discovered evidently interfered very little as concerned the individual's ability to take the punishment of boxing.

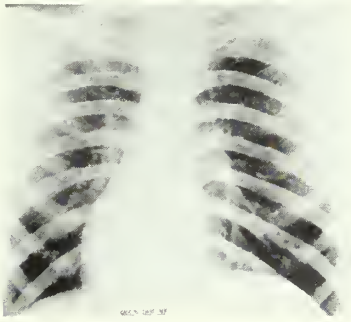

FIGURE 1

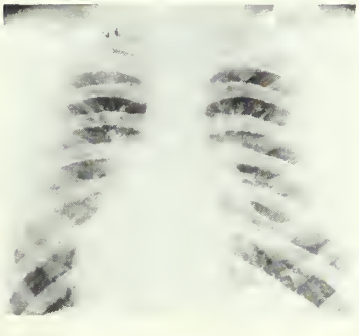

FIGURE 2

Case No. 79831, A. F. S., a female, age 19, entered the University in the Fall of 1933. Her Mantoux test was two plus to one-tenth milligram of Saranac Lake Laboratory Old Tuberculin. Her history was negative as concerns tuberculosis. Her physical examination was negative. Before roentgen ray examination of her chest was done, she developed on December 1, 1933, a severe pain in her left chest accompanied with a temperature of 103°. A pleural effusion rapidly developed on the left side. Because of dyspnea it was necessary to withdraw fluid on several occasions. It was straw colored and showed a high lymphocyte count. A guinea pig was inoculated which unfortunately died three weeks after inoculation. Autopsy failed to show any evidence of tuberculosis. After eight weeks in the University Infirmary the patient withdrew from school and after months in bed she was permitted to increase her activity. She returned to the University in the Fall of 1934. A stereo roentgenogram of her chest done at that time showed a small infiltration at the medial side of the left apex. Her father, a physician, was advised relative to developments and he requested that his daughter be allowed to remain in school. Fluoroscopic examination done in December, 1934, showed a spread of the lesion. This was verified by the X-ray film. Films taken on January 15 and February 1, 1935, showed further progression. All studies were negative

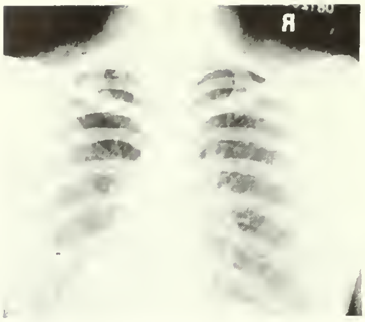

FIGURE 1

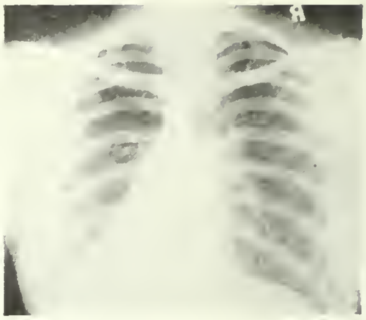

FIGURE 2

with one exception. The blood sedimentation rate which had been normal prior to the Christmas holidays, showed an increased sedimentation rate on the two occasions in January. She withdrew from school the first part of February, and on bed rest at home there has been continued clearing of the infiltration. During this individual's stay in school she carried a reduced schedule, rested each afternoon for two hours and supposedly received nine to ten hours rest each night. It is difficult, of course, to state what might have developed if more physical activity had been allowed, but since rest is the basis for the treatment of tuberculosis limited activity is probably very necessary in lesions such as this to prevent more rapid advancement.

Case No. 88102, R. W. W., an American Indian, entered the University in September of 1935. His Mantoux test was two plus to 0.00002 milligrams of Purified Protein Derivative. He gave a history that at the age of seven he was in a sanatorium eleven months for the treatment of tuberculosis. His weight was 147 pounds. Physical examination showed decreased excursion in the right sub-clavicular region, breath sounds bronchial in character over the right apex, and evanescent rales over the right apex. X-ray of the lungs showed numerous irregular cobweb-like strands in the right first and second anterior interspaces. These were most prominent medially. The pleura appeared to be thickened at the apex. The student entered the Infirmary for further study. There were no symptoms. His temperature and pulse were normal on all occasions. There was no expectoration. Examination of gastric contents was negative for acid fast bacilli on three occasions. Blood sedimentation and a differential blood count were normal. The upper lobe was subsequently filled with lipidol which showed the presence of numerous small cavities. Interestingly, this boy had been on the Haskell Indian School boxing team for three years. He had taken part in intercollegiate boxing without any evident injurious effects. He was insistent on continuing his intercollegiate boxing at the University, but in view of the findings, this, of course, could not be permitted because of the danger of hemoptysis.

Summary

1. Because minimal tuberculosis usually occurs without producing symptoms or physical signs, the status of the individual's lungs as concerns early tuberculosis can be determined only by roentgen ray examination of the infected at regular intervals.

2. Physical activity, especially in competitive athletics should not be permitted in those having

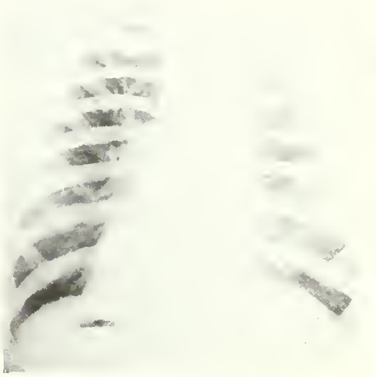

FIGURE 1

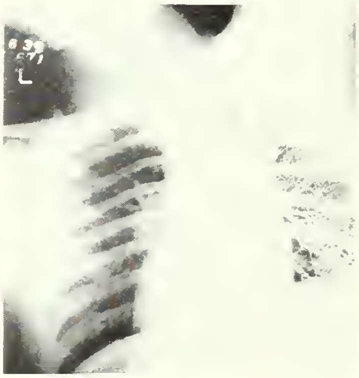

FIGURE 2

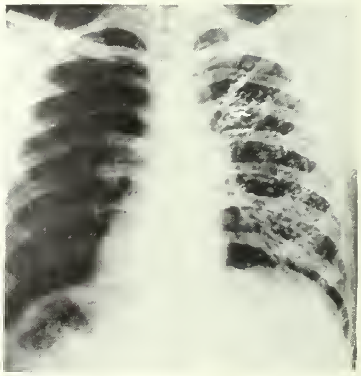

FIGURE 3

a positive Mantoux test until a roentgenogram has been obtained.

3. Rest being the basis of treatment of pulmonary tuberculosis activity should be limited in all pathologically active or doubtful lesions. The course of the lesion can best be determined by serial roentgenograms. The blood sedimentation rate and differential blood counts may be aids in determining early activity of a lesion.

4. Prescribing rest or permitting activity when tuberculosis exists becomes in each case an individual problem. It is small in comparison to the duty each college health service owes to its student body of determining at regular intervals the status of the lungs.

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Chronic Petrositis

Case Report and Autopsy Findings

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IN A RECENT publication by Myerson,[1] *et al.*, on suppuration of the petrous pyramid they state, "When the inferior aspect is eroded a retropharyngeal abscess occurs. We have collected reports of nine such instances."

The case I am reporting is one of chronic petrositis in which the inferior aspect had eroded. Instead of the usual retropharyngeal abscess there developed a number of draining fistulae in the postauricular and cervical regions. Death was due to erosion into the posterior fossa causing meningitis.

Case Report

P. A., male, aged 33, first seen January 23, 1934.

History: About February 15, 1933, the patient developed an earache in his right ear followed by a spontaneous rupture of the tympanic membrane. Two weeks later a localized area of tenderness and swelling developed in the postauricular region. This was lanced by his family physician and pus obtained. In a short time the ear stopped draining but the incised area did not heal. Throughout the following year a total of nine abscesses formed in this region, seven of which were still draining on admission. (See plate I)

Physical examination: Physical and neurological examinations were normal except for moderately decreased hearing right ear, malnutrition, and seven draining sinuses (see plate I) in the right postauricular and cervical regions.

Functional Hearing Tests

Right Ear	Test	Left Ear
±	Renne	+
←---	Weber	
increased	Schwabach	normal
8'	Whisper	20'

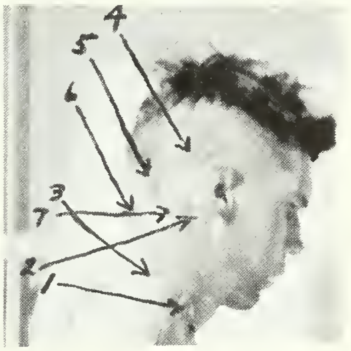
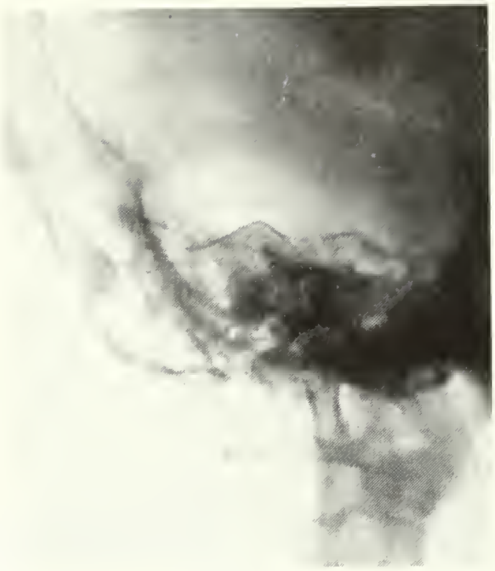


Plate I
Photograph of Patient

Photograph of the patient taken on admission showing the seven draining fistulae.

Roentgenograms of the mastoids (see plate II) show an absence of cell detail on the right.

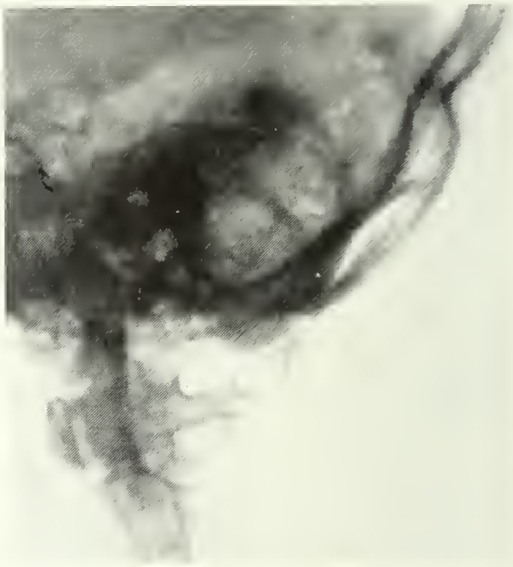


Left Mastoid

Plate II
Roentgenograms of the Mastoids

Serologic and biopsy studies were negative. An organism, morphologically and in stain characteristics resembling the pneumococcus, was recovered from the pus.

Lipiodol was injected into several of the fistulae and a roentgenogram taken (see plate III) which showed the contrast media gravitated to the region of the right middle ear.



Right Mastoid

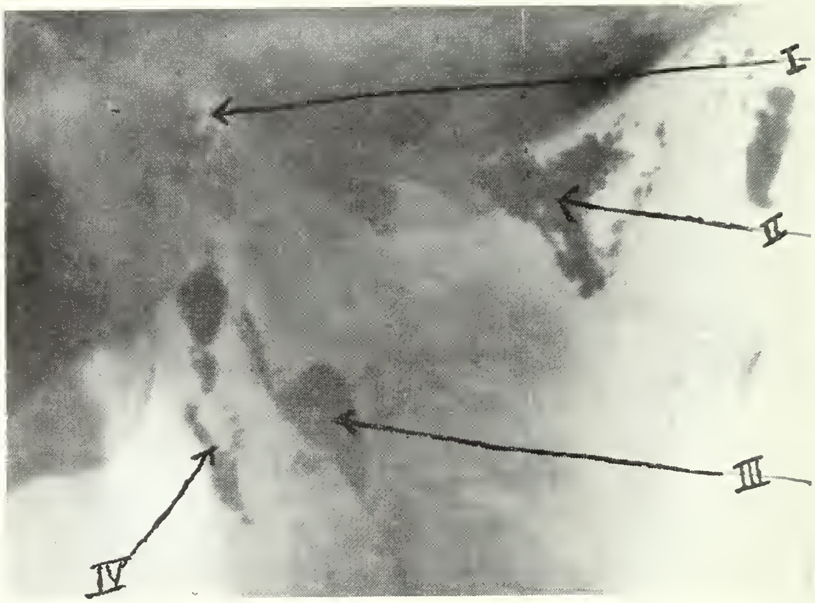


Plate III
Roentgenogram After Lipiodol Injection

I, middle ear, and II, III and IV, cervical and postauricular fistulae, filled with lipiodol.

On January 27, 1934, an exploratory simple right mastoidectomy was done. The mastoid was of the small celled type normal throughout except for thickening of the lining membrane and softened bone in the region of the tip. A careful search was made for areas of diseased bone that might lead into the pars petrosa but none was found.

Post-operatively there was no change either in drainage or the patient's physical condition until about three months later when on April 9, 1934, he suddenly developed meningitis which terminated fatally on April 11, 1934.

The organisms recovered from the spinal fluid and the neck region were in both instances, morphologically and in staining properties, a pneumococcus.

Autopsy Report

The following pertinent pathological changes were found at autopsy:

There was a diffuse purulent meningitis. Dense adhesions between dura and bone were present laterally and inferior to internal auditory meatus, and bone necrosis was marked at these points. (See plate IV.)

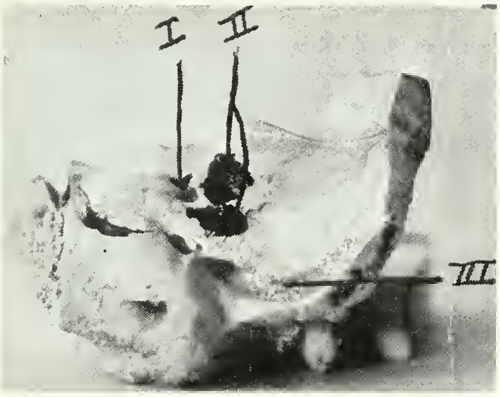


Plate IV
Posterior Aspect of the Temporal Bone

I. Internal auditory meatus.
II. Diseased area of bone.
III. Groove for the lateral sinus.

The inferior aspect of the bone showed an area of erosion in relation to the internal carotid artery and the jugular bulb measuring 20 mm. by 5 mm. (see plate V). This was the origin of the cervical and postauricular fistulae.

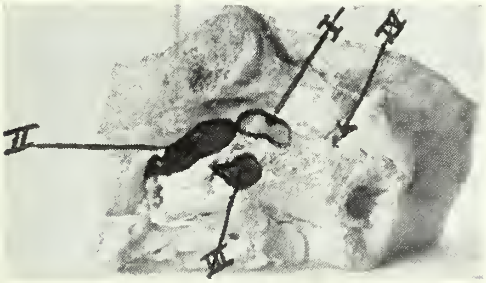


Plate V
Inferior Aspect of Temporal Bone

I. Jugular bulb.
II. Area of diseased bone.
III. Foramen for internal carotid artery.
IV. Stylomastoid foramen.

By dissection two groups of cells were followed from the mastoid into the pars petrosa, one from above the posterior semicircular canal and one below (see plate VI). In this dissection no diseased bone was encountered until the pars petrosa was reached.

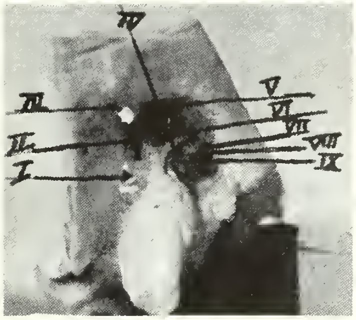


Plate VI
Lateral Aspect of the Temporal Bone after Dissection

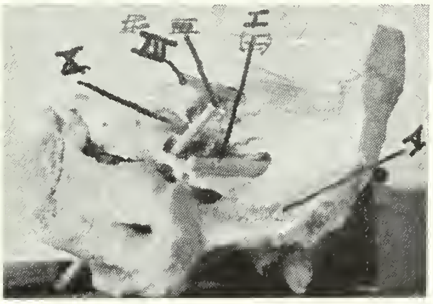


Plate VII
Posterior Aspect of the Temporal Bone after Dissection

I. One of the groups of cells leading into the pars petrosa.
II. Posterior semicircular canal.
III. The other group of cells that lead into the pars petrosa.
IV. Facial nerve.
V. Superior semicircular canal.
VI. Lateral semicircular canal.
VII. Pulley for the tensor tympany muscle.
VIII. Oval windows.
IX. Round window.
X. Internal auditory meatus.
XI. Probe showing connection between two diseased area of bone.
XII. Groove for lateral sinus.

Summary and Conclusions

A case of chronic petrositis is reported in which clinically the mastoid and middle ear were normal except for decreased hearing and in which roentgenographically there was an absence of cell detail. The patient did not have the pain said to be characteristic of an acute petrositis, nor was there a retropharyngeal abscess as reported in the nine cases in the literature in which there was erosion of the inferior aspect of the bone. Judging from the extensive involvement of the pars petrosa in this case, probably no surgical procedure would have been adequate to cope with the situation.

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The Treatment of Foot Ailments*

Seen in Everyday Practice

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MY SUBJECT is an humble one which rarely reaches the headlines. For that very reason, however, it has been neglected by degrees to the detriment of the physician, as well as the patient. Its neglect is proved by the more numerous chiropodists, chiropractors, osteopaths, and other irregulars who make inroads not only on this part of our practice but on other parts as well. I shall try to aid the weak small voice of my subject by calling your attention to its importance.

Pronated or flat feet are the most common of all foot ailments and occur in men, women and children. It is congenital or acquired, primary or secondary, and rigid or flexible in type.

The flexible type is the most common which, when neglected, sometimes becomes the rigid type.

Most important is the proper diagnosis—is the fallen longitudinal arch caused by a spastic peroneal muscle? Is there an abnormally small pull upon the tibial tendons? Is there an accessory scaphoid bone? Are the tibial muscles of normal strength? Is the walking done correctly? Are the bones of normal development? Is it the result of overuse? Many such questions must be answered before treatment is begun.

Not all feet with fallen or low longitudinal arches need treatment. The congenital cases which are symptomless need no treatment. The same is true of the acquired type. Only those cases need treatment which are giving trouble locally or referred to other parts, such as the legs, lower back, or generally. This is an important point as the treatment of symptomless feet may actually be the cause of pain by the changed foot mechanics.

Flexible Type—The causative factor must be found and this eliminated. Granting that the foot is normal with the exception of its being flat, certain conservative procedures should be carried out to correct the faulty foot mechanics.

Modern people wear shoes, and hence, the proper kind must be prescribed. Such a shoe should be long and wide enough, it should have enough toe room, it should have a heel not too high and a rigid shank. Such a shoe should be worn during working hours. In the evening if a woman wishes, she may wear a more stylish shoe for the few hours. Some support is as a rule necessary for the longitudinal arch. This should be flexible and not rigid. Sponge rubber or felt is the best. This support should be fit to the individual's foot and not be a stock support such as the metal supports seen in every shoe and drug store. A metal support acts as a splint to the small flexors of the toes, causes them to atrophy and actually weakens the foot.

A flat foot is a pronated foot. In order to correct the alignment of the astragalus on the scaphoid and to lift the arch a wedge is usually necessary under the inner border of the heel. This varies in height from one-eighth to three-eighth inches and tilts the os calcis causing the head of astragalus to change its position laterally. The center of gravity then falls more through the outer side of the heel. The forefoot which connects with the hind foot through the scaphoid, then becomes pronated.

The flat foot, as you know, is pronated in the hindpart and supinated in the forepart. A wedge under the heel causes these positions to be reversed. Also the posterior tibial muscle is relaxed temporarily, allowing it to shorten and tighten up. The ligaments are only of slight importance—the posterior tibial muscle is the only important structure holding up the arch. This should be strengthened by teaching the patient to walk with the toes straight ahead and by teaching him foot exercises to strengthen the posterior tibial muscle. These exercises should be done several times daily.

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*Presented before the staff of the Deaconess Hospital of Havre, Montana, December 11, 1935.

Frequently, to obtain further correction, a patch is placed under the outer side of the sole. This causes greater pronation of the forefoot and a position of over-correction of the foot. Walking instructions are given.

Not all feet respond to the above measures. Some very heavy people must reduce. Others whose flat feet are due to over-use must rest more. Others will require some rigid support such as solid leather or metal supports. Neither of these should ever be prescribed without plaster models of the feet. Only in this way will the supports fit the feet in question—other methods are guess work and only too often are unsatisfactory. My method of taking these models is as follows: After the feet are greased with vaseline, plaster bandages are gently laid on and wrapped about the soles of the feet. When dry, positive casts are made from them and are used by the shoe maker or brace maker in making the leather or metal supports.

Less commonly a brace is necessary to hold over the foot. Such a brace has an outer bar and the leather strap passing around the inner side of the ankle holds the foot in the correct position by its holding on to the bar. This is known as the Orr brace.

Rigid type flat foot does not so often cause symptoms because of its chronocity and because of the more or less perfect ankylosis of the affected joints. In this type the posterior tibial muscle is practically inactive and in walking only a small amount of motion takes place in the ankle joint proper and the astagalo-scaphoid point. In other words the normal rocking motion is greatly limited. In walking the feet are also used with the toes pointing outward. To treat such a foot it is first necessary to convert the rigid foot into a flexible foot. This is done by forcible manipulation under anesthesia after which the foot is maintained in the normal position by plaster casts for two to three weeks. Subsequently the feet are treated as in the flexible type.

Recently, more and more operative work is being done on flat feet due to failure of conservative treatment to correct the appearance as well as the symptoms. One of the most successful of these operations is the fusion of the scaphoid-cuneiform joint as first advocated by Hoke. A recent modification is the insertion of a bone key into a slot made in the two bones. After about four weeks in a plaster cast walking can begin. Another operation done is a sub-astragaloid fusion. Still another is the transplantation of the anterior tibial tendon backward into the cuneiform or scaphoid or the transplantation of the posterior tibial tendon further backward to make its pull more direct. Another is the removal of the accessory scaphoid if present.

Another very common foot ailment seen in women and perhaps less understood and more poorly treated than flat feet is the metatarsal syndrome characterized by prominent metatarsal heads with callouses over them, hyperextended toes with the distal phalanges in dorsi-flexion, hammer toes, and corns. This is seen in women more than in men because their footwear is less sensible than that of men. They wear shoes which are usually too narrow and short and with higher heels. The foot accomodates itself to the cramped position but at the expense of pain and deformity. One hears so much of a fallen transverse arch, meaning an arch of the metatarsal heads. Since it is not an arch,it cannot fall. Dissection, more over fails to reveal a real arch.

What, then, happens in such a foot? There is a dorsal subluxation of the proximal phalanges upon the metatarsal heads—most commonly of the 2nd and 3rd bones. These metatarsal heads are then more prominent and must bear more weight while the toes bear less weight. The toes become fixed in hyperextension and the short flexor muscles become atrophied. Callouses form, improper walking results, the foot mechanics are altered, and more weight is born on the ball of the foot which is poorly equipped to do it because of the smaller weight-bearing surface consequent to the subluxated toes. The toes function poorly and are ornaments, more than useful members. Frequently bunions and hallux valgus accompany the process.

Conservative treatment again is almost 100 per cent successful in removing the symptoms. To undo the harm one must correct the deformity of the toes. These must be flexed at the phalangeal-metatarsal articulations to reduce the subluxation. Gradual manipulations and flexion exercises may accomplish this. If not, then it should be done operatively, by lengthening the extensor tendons and by a capsulotomy of the joint ligaments. Exercises for the short toe flexors are advised.

A leather bar ¼ inch high is placed on the sole of the shoe just in back of the metatarsal heads. This shifts the weight farther back and causes the toes to flex and bear more weight. Contrast baths are prescribed consisting of cold and hot baths alternately—two minutes hot and one-half minute cold, followed by massage. The flexion of the distal phalanges also need correction. If they do not respond to conservative manipulation, operative treatment may be necessary. A pad within the shoe is sometimes also prescribed especially for women who do not wish the bar, but in my experience the bar works best. In addition a felt support for the longitudinal arch is also given. The above treatment has been highly successful in my hands and I can recommend it. As you see, shaving the callouses is useless as it does not remove the cause.

Corns and callouses on the toes we see every day—yet they are frequently very troublesome and resistant to treatment. Those on the small toes and on the dorsum of the other toes will disappear of themselves if the cause is removed —the pressure. Larger shoes or shoes with softer leather will do the trick. Keratolytic medicines may work but only temporarily. Sometimes a persistent corn on the small toe may be due to a very small exostosis at the interphalangeal joint. If so, it should be removed with a small chisel and the base made smooth—otherwise it will recur. The ones which disable the patient most are the soft corns or those between the toes. Here again pressure is responsible but in addition there may be a hyperextension of the proximal phalanx making its broad base more prominent and causing pressure against the next toe. Bringing the toe down to the normal position will remedy the situation. Otherwise chipping off one side of the base of the phalanx will remove the pressure and the corn will disappear.

Hammer type toes which press against the top of the shoe are often seen and will not respond to treatment unless the toe is straightened out. The capsular ligament is usually contracted and will not stretch. Sometimes a bony ankylosis is present. In either case operative correction with or without fusion of the joint is the best treatment. Temporary plaster fixation is necessary.

Occasionally are seen toes—usually the small toe—which are in hyperextension because of a short extensor tendon. I have seen cases where the small toe was amputated for this condition and because of a corn. This should be condemned as it may lead to more trouble than the original complaint. The tendon cases can very easily be cured by an office procedure. Under local anesthesia a subcutaneous tenotomy with a bard-parker knife can be done, being careful to cut only the tendon. The toe is then taped or splinted down in a flexed position for a few days and the patient need not be confined a single day. Similar procedures are done for simple flexion contractures of the toes. Care must be exercised to cut only the tendon—the nerves and vessels must be avoided and asepsis practiced carefully.

Foot Strain is a general term—it is the result of one or several different conditions which cause local and referred pain. Faulty statics is often present and because of improper alignment of the bones of the ankle and foot there is an obnormal strain on the ligamentous and muscular apparatus. Weight should be borne by the bones—when this is otherwise, sooner or later, pain is present or even swelling and tenderness. Improper walking may be a factor—this is true in people who walk with the feet everted and those who shuffle along without the normal elastic spring. Excessive weight, because of obesity, commonly causes foot strain just as does over use. Store clerks frequently complain of foot strain—also people who suddenly over use their feet, such as an office man, who, without training goes hunting or fishing. Also a person confined to bed several weeks may begin walking too much at first.

The other factors alluded to are flat feet, claw feet, short tendo Achilles and hallux valgus. The symptoms of foot strain are excessive perspiration, local pain and lameness, tenderness of the ligaments about the astragalo-scaphoid joint, and of the plantar fascia. Later there may be some degree of teno-synovitis of the posterior tibial muscle and tenderness of the calf muscles. Swelling of the foot occurs later. The gait varies but in the later stages is stiff and inelastic.

The treatment of the acute stage where pain, swelling, and tenderness are present consists of rest and preferably with heat and massage. Temporary cast immobilization is very effective. After this the static misalignments ought to be corrected as well as the other etiological factors such as the over-weight, over-use, etc. These other factors have been considered elsewhere. Contrast baths are very helpful in these cases.

Claw Feet. The extreme claw foot is not seen very commonly except in polio cases, syringomyelia, and other spinal cord cases. The mild type is common, however, and occurs as a part of the metatarsal syndrome discussed above. The longitudinal arch is usually high, the metatarsal heads prominent, the toes fixed in extension at the metatarsal joints. The conservative treatment has already been mentioned. The extreme cases will not respond, of course, and must be operated upon. The contracted plantar fascia must be stripped loose from the os calcis and the foot wrenched to obliterate the cavus or high arch, the extensor tendons lengthened and a dorsal capsulotomy done of the capsular ligaments, the tendo Achilles lengthened and a plaster boot worn for several weeks. In the extreme cases even operation is not always successful.

Bunions or Hallux Valgus. The treatment of bunions depends upon the extent of deformity and the age of the individual. It is seldom that hallux valgus can be corrected conservatively once the deformity is present but if gotten early before the deformity is marked, one can stop its progress. Invariably the shoes do not fit properly. A large enough shoe for the forefoot is the first essential and one which has a sensible heel. A high heel tends to crowd the toes into the front of the shoe and to aggravate the bunion. A night splint can be worn on the inner side of the foot with some traction on the toes medially. These two measures alone may suffice for the incipient case. Later it is a more difficult matter and operative intervention is necessary. Several factors tend to cause hallux valgus. The first is the subluxation of the large toe outward, the second is the exostosis on the head of the first metatarsal, the third is the fanning of the first metatarsal or the position of varus, the fourth is the pull of the adductor muscles on the bone of the proximal phalanx and the fifth is the dislocation of the sesamoids in the flexor tendon and seventh is the bursitis which usually is present. A proper reconstruction operation should, theoretically, correct all the above causative factors. Whether they all can be corrected and how to do this is still the subject of dispute. Where the individual is quite old very often one will wish to relieve her of pain only and not attempt a complete reconstruction. To accomplish this removal of the exostosis and bursa may suffice. Also this will keep her off the feet but a short while.

In younger individuals, however, a complete reconstruction should be done. A satisfactory operation is the following: A curved incision is made over the bunion region and extending quite high over the extensor tendon. The bursa may or may not be removed and the capsule exposed. This is incised so that a distal flap is made and the exostosis exposed. This is chiseled off and the bone filed smooth and tamped down to leave a smooth surface—a smooth surface has less osteogenic power than a rough one. The lateral side of the joint is then exposed through the dorsal part of the incision. By blunt dissection the space between the first and second metatarsal heads is deepened and in the bottom one will see the tendon of the adductor halluxis and transverse pedis insert into the base of the proximal phalanx. This is sectioned and reattached to the periosteum and capsule of the metatarsal head, thus removing the pull causing abduction of the toe and utilizing it to abduct the first metatarsal instead. Exposing this conjoined tendon is not always easy because it lies in the bottom of the wound. Removal of this tendon from the phalanx immediately releases the toe and it can be adducted with ease. If difficulty is still present the capsule should be incised laterally, thus releasing all tension. The toe is then held over in correct position by imbricating the capsule medially utilizing the flap made earlier. The flap is sewn with chromic No. 1 and one or two interrupted silk sutures can be placed with advantage. The skin is closed with dermal without drainage. A plaster cast including the large toe is applied and left on two weeks. Walking with the cast is then permitted for another week after which the casts may be removed.

Conclusions

The treatment of foot ailments has been neglected by the general practitioner. With a little thought and study he can understand and treat foot ailments with much greater success than the irregular. Treating his foot cases successfully means a greater source of income and keeping the patient.

BOOK NOTICE

A LAYMAN'S GUIDE TO HAY FEVER

Your Hay Fever, by OREN C. DURHAM, with an introduction by MORRIS FISHBEIN, M.D.; 264 pages, cloth, illustrated, first edition; Indianapolis: The Bobbs-Merrill Company: 1936. Price, $2.00.

This work represents the observations on a particular field of allergy as compiled by OREN C. DURHAM, chief botanist of the Abbott Laboratories in North Chicago, Illinois. No form of treatment is outlined by Mr. DURHAM; but is left instead to the guidance of SAMUEL M. FEINBERG, M.D., the well-known allergist. Introduction has been supplied by Morris Fishbein, M.D., editor of the *Journal* of the American Medical Association. The work should be valuable to lay readers, who seem to be convinced that "nobody knows anything about pollinosis." The book should disprove that statement.

DIET IN SINUS INFECTIONS

Diet in Sinus Infections & Colds, by EGON V. ULLMANN, M.D., with diet recipes by ELZA MEZ; first edition, blue cloth, gold-stamped, 126 pages plus index and recipes, illustrated; New York: The Macmillan Company: 1935. Price, $2.00.

Dr. Ullmann, who at one time was special lecturer in biology at the Oregon State College, has entered a field in which he has little danger of challenge, since too little is at present known about the ideal therapy for alleviating sinus affections. It is no more accurate to say that sinusitis yields best to operative procedue than it is to say that a sinus mal-function can be corrected by proper diet. The book itself is interesting, and it has a background of long years of experience on the part of Dr. Ullmann, who is a member of the State Serum Institute of Austria, and is assistant physician at the otolaryngological clinic of Professor Neumann in the University of Vienna. A copious list of suggested recipes is included.

ATLAS OF ANATOMY IN FULL COLOR

An Atlas of Human Anatomy, with explanatory text by JESSE FEIRING WILLIAMS, M.D., and plates by FRANZ FROHSE, MAX BRODEL, and LEON SCHLOSSBERG; first edition, dark brown pebbled cloth, gold-stamped, 62 pages with numerous plates in color. New York City: Barnes & Noble, Inc.: 1935. Price, $2.00

For the extremely low price which the publishers ask for it, this work is immensely valuable. The entire volume, text and illustrations, have been lithographed by Messrs. A. Hoen & Company, Inc., of Baltimore, with such precision that if the plates be magnified to 10 times original size, they will retain their sharpness and clarity of register. The full color work on the plates is beautifully done.

The authors are: Jesse Feiring Williams, M.D., of the Columbia University Teachers' College; Max Brodel and Leon Schlossberg, of the Johns Hopkins University School of Medicine; and Franz Frohse, of the University of Berlin. The book itself would be a worthy addition to the curriculum of any medical school.

PEDIATRICS YEARBOOK: 1935

The 1935 Year Book of Pediatrics, edited by ISAAC A. ABT, Sc.D., M.D., and ARTHUR F. ABT, B.S., M.D.; first edition, dark blue cloth, gold-stamped, 500 pages plus two indexes, illustrated; Chicago, Illinois: The Year Book Publishers, Inc.: 1936. Price, $2.25, postpaid.

Papers reprinted from The Journal-Lancet and included in this year book are: Clifford G. Grulee's "Is Human Milk Best for Babies?" in the November 1, 1934, issue; Frank C. Neff's and George V. Herrman's "Adjuvants in the Treatment of Erysipelas in Infancy" in the May, 1935, issue; Thomas B. Cooley's "Indications for Splenectomy in Children" in the November 1, 1934, issue; and Albert D. Kaiser's "Indications for Tonsillectomy in Children Based Upon the Relationship of the Tonsils to Infections" in the November, 1934, issue.

The selection of papers for abstract purposes in this work is good. The volume may be used with profit by pediatricians and general practitioners who wish to keep thoroughly abreast of current advances in the field of pediatrics.

PHILOSOPHICAL ESSAYS ON LOVE

The Physiology of Love, by PAOLO MANTEGAZZA, translated by HERBERT ALEXANDER, with a foreword by VICTOR ROBINSON, M.D.; first edition (in this format), bright green cloth, purple-stamped, 237 pages, no index and no illustrations; New York: The Eugenics Publishing Company: 1936. Price, $5.00.

This is not a new work; neither does it deal with the physiology of love. It was published in 1872 as the first volume of a trilogy called *The Physiology of Love* (1872), *The Hygiene of Love* (1874), and *Mankind in Love* (1885). As a medical work, it is of the very slightest value, since it resembles the moral essays of La Bruyere or Pascal much more than it does the psychological dissections of Stekel or Adler or Freud.

As a book for the physician's private library, *The Physiology of Love* is something else again. It is, without doubt, one of the world's classics in the field of the extended essay-like study; and as such is altogether delightful. This particular edition is set in Baskerville with an unimposing binding. Since orthographical errors are frequent, and since this is not, as it would appear to be, a genuine *de luxe* edition, it is difficult to see why the publishers ask $5.00 for it.

NEUROLOGY, PSYCHIATRY, & ENDOCRINOLOGY IN 1935

The 1935 Year Book of Neurology, Psychiatry, & Endocrinology, by HANS H. REESE, M.D., HARRY A. PASKIND, M.D., and ELMER L. SEVRINGHAUS, M.D.; first edition, dark blue cloth, gold-stamped, 744 pages plus indexes, illustrated; Chicago, Illinois The Year Book Publishers, Inc.: 1936. Price, $3.00, postpaid.

No other volume extant can take the place of this work for those specialists who desire a résumé of the progress in neurology, psychiatry, and endocrinology for the year 1935. This book is unique; from almost every periodicial devoted to medicine in the world it draws its most important inclusions, and there are journals quoted which the average physician never sees. So broad a scope could not do otherwise than provide the most salient advances in each field examined. That is what makes these little books so valuable.

Neurology has been edited by Hans H. Reese, M.D., professor of neurology and psychiatry in the University of Wisconsin Medical School at Madison; psychiatry has been edited by Harry A. Paskind, M.D., assistant professor of nervous and mental diseases in the Northwestern University Medical School; and endocrinology by Elmer L. Sevringhaus, M.D., associate professor of medicine in the University of Wisconsin Medical School.

The JOURNAL LANCET

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South Dakota State Medical Association
Montana State Medical Association
The Hennepin County Medical Society
The Minnesota Academy of Medicine
The Sioux Valley Medical Association
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VENEREAL DISEASES IN THE PRACTICE OF MEDICINE

This issue of the JOURNAL-LANCET is devoted largely to the consideration of one of the most important and yet one of the most neglected health problems of today. Tuberculosis, cancer and heart disease are the objects of extensive health movements—and properly so. Yet, according to conservative estimates, the incident of syphilis is several times as great as the incidence of tuberculosis, and gonorrhea is much more prevalent than syphilis. Cancer and heart disease are of great importance but we have no satisfactory means of controlling them. We have, on the other hand, all of the scientific information necessary to deal effectively with the venereal diseases. There is abundant evidence that they can be controlled if co-operative action on the part of the medical profession, the health departments and the public can be obtained.

What more could one desire—except possibly an immunizing agent—than science has made available to us for dealing with the venereal diseases? We know their causes. We have laboratory procedures which are of great assistance in the diagnosis of difficult cases. We have specific prevention and therapeutic measures, both of which are exceedingly effective if properly used. We know the mode of transmission, and in most instances, can locate the source of infection with relatively little difficulty. Treatment will render infectious individuals non-infectious, and health laws can compel the occasional unco-operative patient to submit to treatment.

These are the instruments which one needs to deal effectively with communicable diseases and, as has been demonstrated in Denmark and in a few communities in this country, they are entirely adequate for control of syphilis and gonorrhea. Some of the difficulties have been that venereal diseases have not been handled according to epidemiologic methods, and that physicians have failed to recognize any responsibility when dealing with venereal disease except for the individual patients who come to them for treatment. Determination of the probable source of the infection and the proper reporting of the facts to the health department are all too frequently neglected.

Then, too, appropriations for the control of venereal disease have been sadly inadequate. Enormous public funds are continually being expended for the custodial care of patients who are blind, insane or otherwise incapacitated because of venereal diseases; while little if any appropriations are made for the control of these same diseases. Governmental bodies need to be better informed concerning the savings, financial as well as human, which will result from constructive work in this field.

Sex instruction is an important part of a sound educational program, yet knowledge of the dangers involved in promiscuous sex relationships is not a sufficient deterrent to prevent venereal disease, particularly among individuals in those social and economic levels in which these diseases are most prevalent. This has been tried and found ineffective. We need now to develop an appreciation of the importance of the problem and the practice of sound preventive and epidemiological measures. If we can secure a recognition on the part of physicians of the social responsibilities involved in the care of patients with venereal disease, reasonable co-operation between physicians and health officials and more adequate appropriations for venereal disease activities one of the greatest health problems of all times can be brought under control.

H. S. D.

FATIGUE AND AUTOMOBILE ACCIDENTS

Unprecedented improvement in the comfort and riding qualities of automobiles has both speeded up traffic and greatly extended the daily mileage of drivers, whether touring or trucking. This means that the driver has to make increasing use of his eyes and keep alert. A faulty decision may mean a disaster. Such sequelae are apt to be attributed to careless driving or poor technique. While this accounts for many accidents, insufficient attention is given to that fatigue which car comfort and ease of mechanical control cannot obviate, viz., the eye strain and brain fog that comes through constant alertness and a fixed bodily position that does not promote circulatory efficiency. Physiologically the route is well established: the sympathetico-suprarenal system is bombarded incessantly; glycogen reserves are mobilized, the liver drained; a sense of shakiness develops and a pseudo-hunger (low blood sugar) that sends a lot of truck drivers to relays of "doughnuts and coffee" or Coca-Cola. Under these circumstances the response time is lengthened or the monotony of driving induces the man at the wheel to skim by or disregard a caution or "hunch" which ordinarily would catalogue and inspire a slow up.

The answer to most of this is to develop a rule, where possible, to have more than one driver for long touring and change off at least every fifty to seventy-five miles. As for trucking, that is a job which challenges the nerves and digestion of all who venture it. Where least organized the worst features obtain. In time stringent regulations will grow out of the situation. Doctors should be aware of the normal physiology involved.

E. L. T.

MINNESOTA MEETING

The Minnesota meeting for 1936 has now passed into history, and although some of the scheduled speakers notably Professor Sauerbruch of Berlin and Mr. L. Edgar Hoover, director of the Bureau of investigation, U. S. Department of Justice, were unable to be present, it was a splendid meeting. The weather was perfectly fine, making even the motor trip to and from the meeting delightfully pleasant.

By special arrangements with the state board of control, a clinic was given by members of the staff of the state hospital for the insane who showed many interesting cases from that institution, a feature not previously announced. Mr. Donald J. Parsons, federal agent from Washington, gave an interesting talk on methods of crime prevention and exhibited some of the wares of the bureau to an interested audience.

The commercial exhibits were unusually well attended partly because of a scheme by which it was necessary for members to present their registration cards and have them punched at the various booths—thirty at least— in order to qualify for a drawing of prizes offered to the booth visiting participants at the annual open house meeting Tuesday evening.

Everything from start to finish moved with the same smooth clock work that has always characterized Rochester; the attendance taxed the capacity of the well arranged quarters and all those who worked to make it a success have reason to feel proud of their accomplishments.

A. E. H.

SOCIETIES

THE MINNESOTA STATE MEDICAL ASSOCIATION

Eighty-Third Annual Session

ROCHESTER, MINNESOTA

May 3, 4, 5 & 6, 1936

Sunday, May 3, 1936

The Council of the Minnesota State Medical Association met on Sunday morning, May 3, in the University Club of Rochester, where the Reference Committee completed its work; and adjourned until 7 p.m. Sunday evening, when the House of Delegates held its session in Plummer Hall. There was also a special meeting of the Council on Monday, May 4, at the University Club, at 11:45 a.m.

Monday, May 4, 1936

The medical section of the convention opened Monday morning at 8:30 a.m. in the Auditorium of Saint Mary's Hospital in Rochester, with a cardiac clinic given by Dr. F. A. Willius and Dr. H. L. Smith, of the Mayo Clinic. This occupied 30 minutes.

At 9:00 a.m. on Monday in the Auditorium, Dr. F. J. Heck, of the Mayo Clinic, gave a 30-minute clinic on the treatment of secondary anemia. At 9:30 a.m. Dr. S. Amberg, Dr. H. F. Helmholtz, and Dr. R. L. J. Kennedy, all of the Mayo Clinic, presented a one-hour clinic on pediatrics in the Auditorium.

Physicians who were interested in the surgical field watched a clinic on head injuries which began at 8:30 a.m. on Monday in the Nurses' Lecture Room of Saint Mary's Hospital. It was given by Dr. A. W. Adson and Dr. J. G. Love, of the Mayo Clinic, in 30 minutes' time. Next (at 9:00 a.m.) came the one-hour fracture clinic offered by Dr. M. S. Henderson and Dr. H. B. Macey, of the Mayo Clinic, in the same room. It was followed at 10:00 a.m. by a clinic on gas gangrene infections in civil practice, offered by Dr. Hugh Cabot and Dr. R. K. Ghormley, of the Mayo Clinic. This was a 30-minute clinic.

Meanwhile, in Rooms I and II of Saint Mary's Hospital, Dr. M. S. Henderson, Dr. H. W. Meyerding, Dr. R. K. Ghormley, and Dr. H. B. Macey were presenting demonstrations on orthopedic surgery. In Rooms III and IV of the hospital, Dr. Virgil S. Counseller of the Mayo Clinic was presenting a demonstration on general surgery; while in Rooms VII and VIII Dr. J. deJ. Pemberton, of the Mayo Clinic, was continuing the work in general surgery. Neurologic surgery received attention in Rooms IX and X of Saint Mary's Hospital, from Dr. A. W. Adson, Dr. W. McK. Craig, and Dr. J. G. Love.

The section on medicine was presided over by Dr. F. J. Hirschboeck, and the section on surgery was headed by Dr. G. B. New.

At 10:30 a.m. on Monday there were scientific demonstrations and exhibits in East and West Halls; and at 11:00 a.m., Dr. Donald C. Balfour, president of the American College of Surgeons, delivered his address in the Auditorium, on surgery. Luncheon followed at 11:45.

Dr. Leon Asher, professor of physiology in the University of Berne in Switzerland, and director of the Physiological Institute of Berne, spoke on "Functions of the Spleen" in the Auditorium at 1:00 p.m. He was followed at 1:45 p.m. by the Russell D. Carman lecture, delivered by Dr. Willis F. Manges, of Philadelphia, who chose as his subject, "Foreign Bodies and the Use of the X-ray Examination in their Localization and Removal." Dr. Manges, who is professor of roentgenology in the Jefferson Medical College of Philadelphia, was introduced by Dr. E. T. Leddy, of Rochester, Minn., and he was sponsored by the Minnesota Radiological Society. On the same program, Dr. E. L. Tuohy, of Duluth, spoke on, "The Age Factor and Intensity of Gall Tract Disease as Therapeutic Determinants."

Further scientific demonstrations and exhibits were held at 2:45 p.m. on Monday in East and West Halls.

A hay fever symposium on the causes, diagnosis, and treatment of the condition was held at 3:15 p.m. on Monday in the Auditorium, being presented by Dr. R. V. Ellis, Dr. H. B. Sweetser, Jr., and C. O. Rosendahl, Ph.D., all of Minneapolis. Oxygen therapy was offered by Dr. O. E. Locken, of Crookston; and Dr. H. E. Michelson, professor and chief of the department of dermatology of the University of Minnesota Medical School, offered, "A Few Axioms in Dermatological Diagnosis." Dr. M. O. Wallace, of Duluth, spoke on "The Management of the Minor Ailments of Pregnancy." Dr. J. J. Swendson, of Saint Paul, delivered a talk, "Various Drugs Used to Supplement Barbiturates in the Production of Obstetric Analgesia and Amnesia." He was followed by Dr. E. A. Regnier, of Minneapolis, who spoke on, "The Management of Appendicitis." This series was concluded at 4:45 p.m. on Monday.

The annual meeting of the Minnesota State Medical Association and the Women's Auxiliary to the Association was held at 8:00 p.m. Monday evening in the First Methodist Church of Rochester. Dr. C. W. Mayo, president of the Olmsted-Houston-Fillmore-Dodge County Medical Society, delivered the address of welcome, followed by Dr. W. W. Will, of Bertha, who delivered the "President's Address." Mr. E. M. Hammes, of Saint Paul, spoke for the Women's Auxiliary, and Dr. William J. Mayo offered the foreword to the address of Olin West, M.D., Chicago, secretary and general manager of the American Medical Association, who spoke on, "Medicine Today."

Tuesday, May 5, 1936

The medical section, with Dr. F. J. Hirschboeck presiding, opened on Tuesday morning at 8:30 in the Auditorium, with further clinics offered by members of the Mayo staff. Dr. P. A. O'Leary presented a clinic on "Specific and Non-Specific Treatment of Syphilis": followed at 9:00 a.m. by a 30-minute clinic, "Allergic Manifestations in Skin Diseases" under the aegis of Dr. L. A. Brunsting. Dr. E. H. Rynearson and Dr. E. J. Kepler offered a clinic, "The Practical Management of Chronic Infectious Arthritis" at 10:00, which was likewise a 30-minute clinic.

The surgical section, with Dr. G. B. New as chairman, opened at 8:30 on Tuesday morning in the Nurses' Lecture Room of Saint Mary's Hospital, with a clinic, "The Diagnosis of Surgical Urological Conditions," presented by Dr. W. F. Braasch and associates. Dr. G. B. New and associates gave a 30-minute clinic on "Lesions of the Mouth and Throat," followed by Dr. E. B. Tuohy, who presented a 30-minute clinic on "Intravenous Anesthesia," illustrated with slides and motion picture projection machine.

Operative procedures were demonstrated in Rooms I and II by Dr. C. F. Dixon, in Rooms III and IV by Dr. Waltman Walters, in Rooms V and VI by Dr. J. C. Masson, and in Rooms VII and VIII by Dr. S. W. Harrington. These clinics all dealt with general surgery. A clinic on neurologic surgery was presented by Dr. A. W. Adson, Dr. W. McK. Craig, and Dr. J. C. Love, in Rooms IX and X of Saint Mary's Hospital.

At 11:00 a.m. on Tuesday in the Auditorium of Saint Mary's Hospital, Dr. Elliott P. Joslin, professor of medicine in the Harvard Medical School and director of the George F. Baker Clinic in Boston, Mass., spoke on "The Treatment of Diabetes." He spoke until 11:45, at which time the morning session was terminated for luncheon.

At 1:00 p.m. on Tuesday, Dr. Ferdinand Sauerbruch, professor in the University of Berlin, spoke briefly in the Auditorium, followed by Dr. F. A. Coller, of Ann Arbor, Michigan, professor of surgery in the University of Michigan Medical School, and director of the department of surgery of University Hospital, who spoke on "Studies in Water Balance, Dehydration and the Administration of Parenteral Fluids." Dr. G. A. Earl, of Saint Paul, delivered an address, "Duodeno-Jujenostomy for Duodenal Ileus and Duodenal Obstruction" at 2:30 p.m. on Tuesday.

Dr. O. J. Hagen, of Moorhead, opened the session at 3:15 p.m. with his subject, "Regional or Terminal Ileitis," saying that early diagnosis and treatment gave promise of restoring "practically all cases" to health and physical well-being.

Dr. H. J. Lloyd, of Mankato, spoke on "Congenital Heart Defects and the Importance of Early Diagnosis" at 3:30 p.m. He was succeeded by Dr. E. N. Peterson, of Eveleth, who discussed "Blood Transfusion." Dr. O. J. Campbell, of Minneapolis, speaking at 4:00 p.m., explained "'Bumper' Fractures of the Tibia," a new type of accidental fracture which has arisen from contacts with automobile bumpers. Dr. W. G. Workman, of Tracy, offered "Erythema Multiforma, Complicated by Severe Gastro-intestinal Disturbances and Hemorrhage from Mucous Membranes in a Primipara" at 4:15 p.m.; and at 4:30 p.m. Dr. F. E. B. Foley, of Saint Paul, offered, "The Surgical Treatment of Hydronephrosis, a New Operation for the Relief of Uretero-Pelvic Junction Stricture." This particular series of papers was concluded at 4:45 p.m. by Dr. M. H. Tibbetts, of Duluth, who discussed "Changes in Aortic Shadows Following Injuries to the Spine."

At 7:30 p.m. on Tuesday, the Olmsted-Houston-Fillmore-Dodge County Medical Society played host to the Minnesota State Medical Association in the Rochester Armory, with President Charles W. Mayo as presiding officer. At this open house meeting, Mr. J. Edgar Hoover, chief of the Department of Investigation of the Department of Justice in Washington, D. C., presented an exhibit on methods of crime investigation used by Government secret service men in the pursuit of criminals. Actual methods used in the testing laboratories of the Department at Washington were on exhibit, with explanatory lectures by Government men attached to Mr. Hoover's service. At 9:30 p.m. on Tuesday in the Armory, refreshments were served, and there was a grand drawing for the visiting booth prizes.

Wednesday, May 6, 1936

The medical section of the convention opened on Wednesday at 8:30 a.m., with further clinics by members of the Mayo Clinic. Dr. G. B. Eastman began the clinics by his 30-minute clinic on "The Management of Duodenal Ulcer," which was followed at 9:00 a.m. by Dr. J. Arnold Bargen, speaking on "The Management of Patients With Irritable Colon." There was a one-hour symposium on headaches at 9:30 a.m., with neurologic discussion by Dr. F. P. Moersch, ophthalmologic discussion by Dr. A. D. Pranger, otolaryngologic discussion by Dr. H. I. Lillie, and clinical discussion by Dr. F. W. Gaarde.

The surgical section on Wednesday opened with "Newer Conceptions in the Treatment of Gonorrhea," by Dr. L. G. Stuhler (male aspects), and Dr. L. M. Randall (female aspects), each of whom spoke for 15 minutes. These clinics were held, like the preceding days, in the Nurses' Lecture Room of Saint Mary's Hospital. At 9:00 a.m., Dr. R. D. Mussey, Dr. L. M. Randall, and Dr. A. B. Hunt, all of the Mayo Clinic, discussed "Obstetric and Gynecologic Dry Clinic." At 10:00 a.m. there was a proctologic clinic for 30 minutes, presided over by Dr. L. A. Buie and Dr. N. D. Smith.

The operative demonstrations on Wednesday were inaugurated by Dr. M. S. Henderson, Dr. H. W. Meyerding, Dr. R. K. Ghormley, and Dr. H. B. Macey, who were situated in Rooms I and II of Saint Mary's Hospital in work devoted to orthopedic surgery. General surgery was represented by Dr. Charles W. Mayo in Rooms III and IV, and Dr. H. K. Gray in Rooms VII and VIII. Dr. A. W. Adson, Dr. W. McK. Craig, and Dr. J. G. Love continued their work in neurologic surgery in Rooms IX and X.

At 11:00 on Wednesday morning, the general assembly was held, with the secretary's report for the year, the installation of officers, and a tribute to Dr. E. Starr Judd, who died during the Association year. Dr. Donald Guthrie, of Sayre, Pennsylvania, director of the Guthrie Clinic, then addressed the assembly on "The Surgical Aspects of Peptic Ulcer." The assembly was adjourned at 11:45 a.m. for luncheon.

Dr. Fred M. Smith, of Iowa City, Iowa, professor of the theory and practice of medicine in the University of Iowa College of Medicine, opened the afternoon session at 1:00 p.m. with "Concerning the Prognosis and Certain Aspects of the Treatment of Coronary Artery Disease." He was succeeded by Dr. M. J. Shapiro, of Minneapolis, who addressed his listeners on "Diagnostic Problems in Heart Disease in Children and Young Adults." Dr. G. R. Kamman, of Saint Paul, spoke at 2:00 p.m. on the "Correlation Between Variations in Barometric Pressure and Incidence of Cerebral Hemorrhage." Dr. Leo G. Rigler, of the roentgenologic department of the University of Minnesota Medical School, discussed "X-ray Diagnosis of Carcinoma of the Lungs"; followed by Dr. G. N. Ruhberg, of Saint Paul, who talked on "Myxedema, Its Nervous and Mental Manifestations."

At 3:15 p.m. in the Auditorium, Dr. C. H. Mead, of Duluth, spoke on "Ovarian Hemorrhage Simulating Acute Appendicitis." Dr. E. K. Geer, of Saint Paul, discussed, "Active Pulmonary Tuberculosis Without Symptoms." Dr. R. A. Johnson, of Minneapolis, talked on "Upper Abdominal Pain: Its Occurrence in Acute Gonorrheal Pelvic Inflammatory Disease." The Medical Question Court was presided over by Dr. W. A. O'Brien, of Minneapolis, professor of pathology in the University of Minnesota Medical School.

Scientific Exhibits

In the West Hall of the Auditorium at Booth 22 was the general physical therapy exhibit. Booth 24 contained an exhibit on the demonstration of Schick and Mantoux tuberculin reactions. Booth 26, under supervision of Dr. Luther Thompson, of Rochester, was given over to a cultural method for the demonstration of gonococci. In Booth 27, the department of dermatology and syphilology of the Mayo Clinic offered exhibits on contact dematitis and syphilology. Booth 28 contained an exhibition on fever therapy, under the charge of Dr. A. U. Desjardins and Dr. W. C. Popp, of Rochester. Booth 49 housed an exhibit of the Minnesota State Pharmaceutical Association. Booth 54 was occupied with the amelioration and prevention of deafness. Booth 59, under the supervision of Dr. R. G. Green, professor of bacteriology in the University of Minnesota Medical School, contained an exhibit on the occurrence of tularemia in man and animals, and upon filterable viruses.

Booth 63 (stage) was devoted to the Section of Proctology of the Mayo Clinic, headed by Dr. L. A. Buie, of Rochester.

Booth 64 was occupied by the Mayo Foundation for Medical Education and Research. Dr. H. S. Plummer and associates demonstrated "Diseases and Function of the Thyroid Gland." Dr. Charles W. Mayo and Dr. E. G. Wakefield offered a surgical procedure for "Disseminated Polyposis of the Colon." Dr. B. T. Horton and Grace Roth, B.S., demonstrated "Hypersensitiveness to Cold With Local and Systemic Manifestations of a Histamine-Like Character: Its Amenability to Treatment." Dr. G. J. Thompson offered "Trans-Urethral Surgery," and Dr. Hamilton Montgomery offered "Histopathology of Cutaneous Tuberculosis."

Booth 65 was engaged by the Medico-Legal Advisory Committee of the Minnesota State Medical Association, in charge of Dr. B. J. Branton, of Willmar.

In the East and West wing corridors, space was occupied by the Auxiliary to the Minnesota State Medical Association, the Minnesota Public Health Association, the Minnesota State Board of Medical Examiners, the Minnesota State Department of Health, and various committees of the Minnesota State Medical Association. In Booth G-12, the United States Army and Navy, under the supervision of various officers, presented several exhibitions. There were also, of course, the technical exhibits of various commercial companies.

Election of Officers

Selecting Saint Paul as the site of the 1937 convention, the House of Delegates on Tuesday, May 5, 1936, selected Dr. A. W. Adson, of the Mayo Clinic department of neurologic surgery, Rochester, as president-elect, to succeed President W. W. Will, of Bertha, on January 1, 1937.

Dr. H. W. Goehrs, of Saint Cloud, was elected first vice president of the Association, with Dr. D. P. Head, of Minneapolis, as second vice president. Dr. E. A. Meyerding, Saint Paul, was re-elected secretary, and Dr. W. H. Condit, Minneapolis, was re-elected treasurer.

Dr. W. F. Braasch, of Rochester, was re-elected first delegate to the American Medical Association House of Delegates, and Dr. W. A. Coventry was elected second delegate. Alternates are Dr. W. L. Burnap, of Fergus Falls (for Dr. Braasch), and Dr. George Earl, Saint Paul (for Dr. Coventry). Dr. E. A. Meyerding's term as alternate does not expire until 1937.

Dr. J. S. Holbrook, of Mankato, was re-elected councillor for the Fourth District; Dr. James M. Hayes, Minneapolis, was re-elected councillor for the Sixth District; and Dr. W. L. Burnap, Fergus Falls, was re-elected councillor for the Eighth District. Terms of the other councillors did not expire in 1936, and there were no other elections.

Auxiliary to the Minnesota State Medical Association

The Auxiliary to the Minnesota State Medical Association met for election of officers at the Damon Hotel in Rochester at 10:00 a.m. on Tuesday. Mrs. J. F. Norman, of Crookston, was elected president-elect, to succeed Mrs. E. M. Hammes, of Saint Paul, the president for this year. Mrs. Hammes assumed her new duties on Wednesday, May 6, 1936, after a luncheon in Breckenridge Memorial Hall in Rochester. Mrs. Norman will be inducted one year from that date.

Mrs. W. B. Roberts, of Minneapolis, was elected first vice president; Mrs. M. A. Nicholson, Duluth, was elected second vice president; Mrs. A. C. Baker, Fergus Falls, was elected third vice president; Mrs. F. A. Erb, Minneapolis, was chosen recording secretary; and Mrs. R. C. Josewski, Stillwater, was selected treasurer. Mrs. H. C. Cooney, Princeton, was elected to be auditor. Mrs. F. J. Elias, Duluth, retiring president, reported that membership now totals almost 1,000 women.

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting Held February 13, 1936

Dr. Floyd Grave, President, in the Chair.

POSTERIOR ROOT SECTION OR RHIZOTOMY

Edward T. Evans, M.D.

The real art of medicine as far as the lay person is concerned lies not in perfect diagnosis, not in laboratory technique, not in prognostication of disease, but rather in the amelioration or relief of symptoms. Often the physician reaches the highest art of medicine when, because of his understanding of the individual, he is able to soothe and placate the mental distress attendant upon a hopeless condition, such as, inoperable carcinoma. In other instances, he may reach the highest peak of his art when, by simple or even empirical measures, he is able to control or do away with actual distress.

Pain is a variable factor dependent upon, first, the origin and causation of that pain; second, the patient's individual reaction to that pain. Some months ago, Dr. Caron presented a paper before this club outlining simple procedures in which, with the use of novocaine, symptomatic relief of pain might frequently be obtained. In the course of his paper, he mentioned the central fixation of a pain complex with persistence of the subjective interpretation of pain long after the causative factors were absent. This type of pain can often be cured by either neuropsychiatric approach or by a traumatic interruption of the vicious circle established in the patient's sensorium by using suggestive therapy fortified by some direct but harmless surgical procedure. This procedure, judiciously used, falls within the realm of the art of medicine. It is, however, often effected in chiropractic, osteopathic, toe twisting, and faith healing ventures.

We have also pure peripihereal types of pain resulting from local lesions, either actual neuritis or referred neuralgic symptoms. Most of these cases are amenable to the treatment directed toward the cause.

The literature is full of modern trends of surgery in the amelioration of pain due to vasomotor disturbances and due to reflex sympathetic and para sympathetic phenomenon as manifested so typically in Raynaud's disease and thrombo-angiitis obliterans.

The two cases which I wish to present tonight do not fall into the classification of any of these ordinary painful syndromes. They fall, rather, into that group which, up until the past few years, one considered as having intractable pain.

The question of relief of intractable pain has of late received much attention in the literature. Whereas a few years ago an inoperable carcinoma of the pelvis, inoperable sarcoma of an extremity, and terrifically painful untreatable gastric crisis were placed on symptomatic treatment consisting for the most part of gradually increasing doses of opiates, a whole new vista has been opened by the surgical measures proposed in the following order:

1. Chordotomy, in carefully selected cases.
2. Rhizotomy, in those cases in which a determination of the area involved might predict relief by interruption of the sensory nerves thereto, or in which a division of the posterior roots by their effect upon the white rami of the sympathetic system might afford relief.
3. Sympathetic ganglionectomy by surgical means or by alcohol injection to interrupt the reflex pathway or to change the vasomotor status of the part effected.
4. Spinal anesthesia for temporary amelioration of pain.
5. Spinal root anesthesia at the foramen of exit.
6. Intradural injection of alcohol to more permanently block the sensory distribution to the part effected.

The above procedures all have their field of choice. One may be used in a certain case in preference to another equally useful procedure. None are without risk but any of them are warranted, where indicated, in an otherwise hopeless case doomed to extreme suffering.

The first case I would report is an individual who on December 20, 1921, first reported for treatment of central nervous system syphilis. The first symptoms became evident as a strabismus in September of 1919. Even at that date, he complained of gastric distress. His record from 1921 on is largely confined to consideration of his dizziness, double vision, and gastric distress. In spite of active therapy, the patient at no time responded satisfactorily to treatment. By 1926, the diagnosis of gastric crisis was definitely established. The patient has had numerous hospitalizations varying from fifty days to four hundred and eighty-four days. These periods of hospitalization were marked by repeated attacks of gastric crisis necessitating administration of opiates, in almost every instance morphine alone being satisfactory for its relief. Spinal fluid drainage and gastric lavage was also instituted on repeated occasions. He was hospitalized, on one occasion, up until 1931 for four hundred and eighty-four days. On May 8, 1933, he had completed another period of two hundred and fifty-seven days' hospitalization. I should like to note at this point that repeated gastro-intestinal examinations showed the typical findings which Dr. Allison has mentioned as being present in gastric crisis, that is, an apparently normal stomach in size, shape, and position in which, however, the meal passes rapidly from the stomach during the crisis.

On May 17, 1933, this patient was again admitted to the hospital for gastric crisis, only nine days after his previous discharge. The intractability of his pain, the necessity for repeated doses of morphine had by January 1, 1934, rendered this patient a pitiful example of morphine addiction with almost constant nausea and attacks of crisis occurring at times three and four times a day. It is interesting to note that he at no time had lancinating pains down the lower extremities. After careful consideration of his case, it was decided to perform a section of those dorsal roots which by interruption might effectively interfere with the reflex arc originating in the areas involved, with the added hope that the interference with the white rami might produce relief of symptoms. On February 2, 1934, I performed a posterior root section. Laminectomy was performed from the second to the ninth dorsal vertebrae. The dura was opened, the cord was found clear without adhesions but somewhat smaller than normal. The dura was perhaps slightly thicker than normal. The third to the ninth dorsal roots were bilaterally excised, one and one-half to two centimeters each. The operation was performed under local anesthesia with application of a small crystal of novocaine to each posterior root just prior to its surgical manipulation. The patient made an uneventful recovery except that gastric lavage was necessary for a few days and he was given five hundred cc. of whole blood on the first post-operative day. The patient was discharged from the hospital on December 19, 1934, and has returned to work, assisting in the operation of a small grocery store. He is no longer, as far as we know, suffering from gastric crisis attacks nor is he taking morphine. I should like to mention the fact that the post-operative X-ray study shows that the emptying time of the stomach was, in August, 1934, over six hours.

The second case I wish to present is one which in many of its aspects is familiar to most of you. You will recall that about 1927, one of our police officers was shot in the abdomen by Vern Miller's gang. As a result of this gun shot wound, the patient had perforation of the stomach and duodenum with, it is my understanding, laceration of liver and gall-bladder, loss of the right kidney, and an explosive fracture of the fourth and fifth lumbar vertebrae resulting in bilateral cauda equina lesion. He was in the General Hospital for a period of some seven months, following which he was under the care of Dr. Willard White. It took about five months for him to develop some use of the lower legs and subsequent to discharge from the hospital, he gradually managed to get up and about on crutches with lower leg braces. Unfortunately, in addition to the flaccid paraplegia which he suffered and the incomplete paralysis of bladder and rectum, he developed a severe degree of painful neuritis involving the peripheral nerves of the cauda equina with lancinations. He was first seen at the Veterans' Bureau on Sept. 29, 1930, at which time the diagnoses were concurred in and no recommendations for active treatment other than palliative use of opiates was recommended. Sometime after this, Dr. Maxeiner injected quinine urea hydrochloride into the sciatic trunks without permanent relief. The patient was again admitted to the Veterans' Bureau Facilities on May 14, 1935. During his stay in the hospital, it became increasingly apparent that this patient was a hopeless drug addict as a result of the necessity for the relief of pain down the peripheral distribution of the cauda equina. The amount of opiates taken ranged as high as one twentieth of a grain of delaudid every three hours. For this reason, early in the fall of 1935, the patient was brought to me for consideration of some type of surgical procedure which might give him relief of pain. It was first requested that sub-dural alcoholic implantation be carried out.

On examination of the patient, it was my opinion that the nature of the lesion was such that there might possibly be intradural adhesions which would pocket the alcohol and destroy motor function as well as sensory function. In addition to this, we have had a couple of experiences with intradural injection of alcohol in the presence of diseased cord which were most unfortunate from the standpoint of increase in pain rather than relief of pain. For this reason, after consultation with the neurological service, it was determined on November 4, 1935, that the sensory roots of the lumbar fourth and fifth and sacral first, second, and third should be sectioned with the added assumption that the sacral fourth and fifth roots were, in all probability, already degenerated.

On November 7, 1935, I performed a laminectomy exposing the cauda equina. The laminectomy was carried out from the eleventh dorsal to the third lumbar area. On exposing the pia mater, several calcified plaques were found present with fine adhesions. Isolation of the sensory roots of the fourth and fifth lumbar and first, second, third, fourth, and fifth sacral levels was carried out bilaterally utilizing, as in the first case, the local application of novocaine crystals. Several of these sensory roots produced no pain reaction, others caused definite pain reaction. The roots were resected and layer closure was effected. It is to be noted that the patient has had no opiates of any kind since the sixth post-operative day. Following the operation, there was a partial motor loss of both extremities with, however, subsequent improvement on the right, even at this date beyond that which was present prior to the operation; and during the past two weeks the patient has been developing some increased motor activity of the left leg. One week ago, models were taken for long leg braces and the patient is to be gotten up in these braces with crutches when they are ready. The patient has been up and about in a wheel chair since the second post-operative week.

Discussion

Dr. Willard White: The second case which Dr. Evans presented impresses me a great deal for I have known something about this patient for quite a long time. At the time that he was shot in the abdomen he had a great deal of intra-abdominal injury. The liver was torn, the gall-bladder was open, there was a tear in the stomach, the duodenum was almost completely divided, the right kidney was injured to such an extent that the hemorrhage was very profuse and the kidney had to be removed. I was very much surprised that the patient recovered from his original injuries.

Several circumstances, however, contributed toward his recovery. When he was brought into the General Hospital I was notified that a policeman had been shot in the abdomen and we had him taken to the operating room immediately. We put in a call for donors and there were several policemen there to furnish blood. While we were waiting to match up his blood he was given other fluids intravenously. His abdomen was opened and these various injuries repaired, the liver was sutured to control bleeding, the gall-bladder was closed, the rent in the stomach was closed and the duodenum, which looked a good deal like a rubber hose would if you took a sharp knife and cut it almost completely across, was repaired by making an anastomosis. A few strands had remained on the posterior wall. The right kidney was damaged to such an extent that it had to be removed. The patient was then given blood transfusions. He gradually recovered from the effects of these injuries and was able to be up and around with crutches and could drive his automobile. He had special pedals in his car to keep his feet from slipping off from them. He operated a jewelry store. He began to have a great deal of pain in his back and lower extremities and acquired the morphine habit. Previous to his injury he was a fine type of man. After he acquired the morphine habit one would hardly recognize him as the same individual. He had lost a great deal of weight, smoked almost incessantly, and had burned many holes in his bed. In general he appeared very unattractive.

It is my understanding now that he has not had any morphine since the sixth day after the operation that Dr. Evans did and his general appearance has greatly improved. To see him tonight he looks more like he did before he acquired the opiate habit. It has surprised me that so much can be done by way of removing a constant source of pain and, therefore, make it more practical to free this patient from the morphine habit. This type of operation is a very useful thing and it has gone a long way toward getting this particular individual back in shape so that he will be able to make his living and look after his family. Dr. Evans deserves a great deal of credit for this type of work.

Dr. Stanley R. Maxeiner: I have had the privilege of seeing these two men at the Veterans' Hospital and also witnessed the operation upon the first patient. The second patient was sent to me suffering from almost intolerable pain and asked if we could not do something in the way of injection of the nerve to give him relief. I realized that the point of injection of his sciatic was distal to the site of his pathology and would probably not give permanent relief but that he might have some temporary comfort. The injection was done and the patient did have considerable temporary improvement. However, his pain returned and was so bad that root resection became necessary.

I think that this is a very nice piece of work and that these two cases are educational and give the profession a feeling that there is some procedure which will give definite permanent benefit in cases of intolerable pain.

Dr. O. J. Campbell: I am glad that Dr. Evans brought up the subject of intraspinal injection of alcohol and call attention to the possible damage that may result to the cord or roots if the alcohol is pooled by adhesions. This means of controlling intractable pain has been used very satisfactorily at the University in a number of cases. Its use is so simple and the results so satisfactory in the hopeless cases where it has been tried that it is likely to be more generally taken up. Where adhesions about the cord are suspected, the use of alcohol would seem contraindicated.

Dr. E. T. Evans: In reference to alcohol injection at the firanuba (not intradural injection because in an intradural injection we are killing the sensory nerve cells in the posterior of the cord) if our results are due to a destruction or an alcohol anesthesia of the peripheral nerves, do not forget that they can come back. I have seen two cases of painful extremity from the results of injection of the root of the nerves at their exit in the foramen with alcohol. Relief only lasted six months followed by paraesthesias.

Dr. Stanley R. Maxeiner: With reference to the use of alcohol, one must remember that there is a definite contraindication to its use in motor nerve trunks where impairment of function will be undesirable. This applies particularly to its use in the sciatic nerve and brachial plexus. A permanent involvement of the sciatic following an alcohol injection may result in a lawsuit for malpractice. The sensory nerves and the intercostals may be blocked with alcohol, knowing, however, that there may be definite involvement of the motor function to the muscles of the abdominal wall. Alcohol has been used repeatedly in cases of angina pectoris, fifth nerve involvement, etc., but in the case of the sciatic nerve, I believe that it should always be avoided.

Dr. E. T. Evans: I was referring to the emergence of the posterior root at the spinal foramen.

"PETROSITIS"*

Lawrence R. Boies, M.D.

To many physicians, a diseased middle ear represents an uninteresting condition, just a hole in the side of the head discharging pus. If he looks into this hole, there isn't very much to see.

The small temporal bone contains more anatomical detail than any equivalent amount of space elsewhere within the body. It has the possibility of manifesting more symptoms in amount and variety than any equivalent amount of space elsewhere within the human structure.

What happens when an abscessed ear develops?

Depending on the virulence of the organism and the anatomic structure involved, depends to a great extent what is likely to happen. The middle ear has usually become infected through an inflammatory process coming up through the eustachian tube. When the middle ear has been the seat of inflammation for any length of time, two or three days for example, it is probable that there has been some spread of the infection to contiguous structures, the cells of the mastoid or into the pneumatic spaces if they have formed in the petrous portion of the temporal bone.

The most common route for the spread of infection is in to the mastoid cells. These are pneumatic spaces varying a great deal in size and extent. They may occupy more or less dangerous positions in deep angles and out of the way places, so that once involved, drainage is poor, and inasmuch as these deep angles usually come close to the dura, complicating infection reaching the dura becomes a probability if the products of inflammation find no other outlet.

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*Read before the Minneapolis Clinical Club, February 13, 1936.

These pneumatic spaces are partitioned by compact bone which has replaced the marrow. When the pneumatizing process has been interfered with, diploic structure remains. We may, therefore, have a largely pneumatized mastoid, a diploic one, or a combination of both.

The lining membrane of the pneumatized space is a mucoperiosteum drained by the small regional vessels of the bone. The petrous portion of the temporal bone is not commonly pneumatized; in 10 to 20 per cent cells extend more or less deeply into the pyramid either above the labyrinth, behind or below it or along an anterior position from the eustachian tube. When the pyramid is not pneumatized, its chief content is marrow.

In mastoid infections, we are dealing for the most part with an osteitis involving a bony structure in close relationship to the sigmoid sinus, the dura, the facial and auditory nerves and the semicircular canals. When the infection extends into the petrous pyramid, the same osteitis may be the case, but often the presence of marrow decides the type of pathology present, an osteomyelitis. There may be a combination of both.

The handling of the complications of acute middle ear infections has undergone, I believe, and is undergoing as revolutionary changes as has the care of fractures since the World War. The laity and many physicians have regarded acute middle ears as one of the necessary evils of childhood and their conception of a mastoid infection amounted to a hole or depression behind the ear often subject to periodic discharge of pus. Present day otology has sought and found a better understanding of the pathological process responsible for the persistence of middle ear disease and its sequelae, as well as an improved surgical solution of the problem.

A virulent infection of the middle ear may rapidly spread into the mastoid space and in the course of a few days, sometimes as few as three or four, practically destroy the pneumatized space, or with little generalized destruction extend in toward the lateral sinus to produce phlebitis or thrombosis, or may reach the middle fossa dura above to produce an extradural inflammation. Rarely, vascular channels may carry the infection from the middle ear source into the meninges or brain.

The usual process is a slow suppuration, manifested after the first acute symptoms by discharge from the external canal and often a practically afebrile course until resolution is complete, or symptoms develop making mastoidectomy important, or the inflammation subsides to a state of chronicity—through neglect.

The more common complications of mastoid infection are the extension to the margin of the mastoid where it is in contact with the dura to produce an extradural inflammation. There are three sites which in order of frequency are as follows: (1) the lateral sinus, (2) the dura above the tegmen or "roof" of the mastoid, and (3) along the petrous pyramid.

The vascular relationships between the mastoid cells and the lateral sinus are more abundant than those between the dura over the tegmen of the mastoid and the mastoid cells below. This undoubtedly is an important factor in the greater incidence of extradural inflammation over the lateral sinus than at any dural sites. The development of an extradural inflammation above the tegmen of the mastoid is favored by anatomic structure in which extensive cell structure exists in the zygomatic process or in the squama. This complication is next in frequency to the perisinus pathology.

A complication of middle ear and mastoid disease which has been too seldom appreciated in the past has been the involvement of the petrous pyramid by the extension of the infection from these sites. Undoubtedly this is a fairly common occurrence in the course of an acute mastoiditis and often presents no special problem if when the surgical treatment is carried out, a thorough complete mastoidectomy is performed to carefully open up all cell groups and exenterate the infected tissue; drainage then may be adequate and resolution progressive.

Special attention has, however, been centered in recent years on complicating infection of the petrous pyramid when certain symptoms and signs develop to determine the site of suppuration in the pyramid as the major problem. This may occur before any surgical procedure has been performed on the mastoid bone; more often it presents itself as a complication following the ordinary mastoidectomy.

The story is usually that (1) discharge from the mastoid wound or middle ear, usually both, continues beyond a period when it should have diminished or ceased, (2) the patient continues to have a low grade fever ranging around 100 degrees, and (3) he complains of headache, retrobulbar or temporoparietal in location, worse at night and especially in the early morning, and (4) a fourth manifestation is in an abducens paralysis on the involved side, which sign may be present in about one-half the cases.

Aural discharge, pain on the involved side, and abducens paralysis constitute the Gradenigo Syndrome which from the time of its first description in 1904 up to very recently we have considered to be a clinical entity, but which we now prefer to consider as symptomatic of petrous pyramid infection. The abducens paralysis, as I have stated, may only be present in about one-half the cases. Without it the triad of symptoms described by Gradenigo is not complete.

This infection of the petrous pyramid manifesting itself as it does by discharge, low grade fever, and characteristic headache, and in some cases an abducens paralysis, we now term a "petrositis."

The discharge and fever result from suppuration. The characteristic headache occurs from meningeal irritation along the course of the dura covering the temporal bone, either at some point along its superior border or near its tip. It is considered to be due to irritation of the superficial petrosal nerve. The abducens paralysis results from the inflammation reaching Dorello's canal, perhaps better termed the abducens canal.

Within the past year and a half, I have had the opportunity to observe several cases of "Petrositis," and at this time I shall briefly outline their histories.

Case 1 was an eight year old boy who had had a simple mastoidectomy six weeks after the onset of an acute otitis media with spontaneous rupture of the ear drum and a profuse purulent discharge. At the time of this mastoidectomy, he had had an abducens paralysis for 12 days. The X-ray study had shown a very large mastoid for a boy of eight years with extensive pneumatization in all directions; pneumatic cells were present in the petrous pyramid which was distinctly clouded. Following the mastoidectomy there had been a distinct improvement in symptoms for a short period but discharge, fever, headache and the abducens paralysis were present when I saw him on the 86th day of his illness.

The mastoid wound was revised to remove considerable infected cell structure and granulations. The lateral sinus was widely exposed and the middle fossa dura uncovered above the tegmen of the mastoid. A lead through some cell structure in front of the knee of the sinus and through a retro-facial group of cells above the jugular bulb resulted in the sudden flow of pus from the petrous pyramid. The opening was enlarged for free drainage and the wound packed open. The condition of the patient promptly improved; the abducens paralysis cleared in four weeks and recovery was otherwise uneventful.

Case 2 was a seven year old girl who was operated on the twenty-first day of her illness for an acute coalescent mastoiditis. Several days later, an apparently normal convalescence was interrupted with the onset photophobia, pain behind the eye on the involved side, and a temperature rise. This persisted but the wound had healed uneventfully and was dry. However, the mastoid wound was re-opened and an extensive exposure made of the lateral sinus and the dura of the middle fossa above the mastoid tegmen. The angles were deepened to reveal any cell leads into the petrous pyramid; none were found. Improvement followed but five days later an abducens paralysis developed. An X-ray study revealed no definite pneumatization but a distinct clouding on the involved side. However, the temperature and pain improved at this point and the patient went on to a gradual and complete recovery. The abducens paralysis cleared in about one month.

In this case, one without evidence of pneumatization of the pyramid, an inflammatory process without definite suppuration apparently involved the pyramid but healed spontaneously.

Case 3. A 17 year old boy whose mastoid was extremely large developed headache, fever, and increased discharge, during convalescence and an abducens paralysis from an operation from an acute mastoiditis. X-ray studies indicated a pneumatized mastoid definitely clouded. The interesting feature of this case is the large amount of space posterior to the labyrinth through which the drainage of the pyramid was accomplished. After a very complete secondary mastoidectomy, the pyramid was uncapped along the superior posterior border to a distance inward to the lip of the internal auditory meatus to espose cell structure filled with a thin purulent secretion. The dura had been lifted over the exposed area after a considerable removal of squama. The exposure can be seen on the X-rays taken after the operation which indicate the bone removed. Drainage was insured by packing the dura up with rubber dam, and the mastoid wound open. Recovery was uneventful; the abducens paralysis cleared in three weeks.

Case 4 in its essential details is almost a duplicate of the preceding one except that the patient, a 12 year old girl, was much sicker. A simple mastoidectomy had been done on a very large mastoid about one week after the onset of an acute otitis which had been rapidly complicated with mastoid symptoms. Immediate improvement followed but soon a temperature rise, headache, and continued discharge complicated the picture. At a second operation, a wide exposure of the middle fossa dura and the lateral sinus with attention to all possible cell leads again brought improvement. This was not permanent, however, for an abducens paralysis appeared in the midst of continuous fever, headache, and discharge. X-rays indicated a moderate pneumatization of the pyramid with definite clouding. In a third operation, the dura was elevated after removal of some squama above and the superior posterior margin of the pyramid uncapped for a distance of about one centimeter and some cell structure opened posterior to the labyrinth. The dura was packed away from this area and the wound packed open. Convalescence was then satisfactory and the abducens paralysis cleared in about one month.

In all cases, the hearing was normal after healing was complete except in the first instance. I had no pre-operative record of the hearing in this instance so I am not certain that it was normal prior to this infection.

Yesterday, I operated on a fifth case, a woman of 42 who had had a discharging ear for over two months, a dull headache behind the eye on the involved side and a low grade fever. The decision to have medical attention was prompted by the fact that she developed some difficulty in swallowing and trismus. A moderate fullness of the lateral pharyngeal wall on the involved side was noted and we felt that it was probable that the inflammatory process had extended from the petrous tip down through the retro-pharyngeal space by way of the foramen lacerum. There was no definite fluctuation and under observation the swelling subsided.

These X-rays indicate the very definite clouding of the petrous pyramid. At operation, pale white granulations filled most of the mastoid space and the pyramid was entered through a cell lead posterior to the labyrinth and below it. This cell structure was also very soft. Only a scant amount of pus was encountered.

As a concluding thought, I would make the suggestion that with a better appreciation of the possibilities of mastoid and middle ear infection, it is probable that chronic otitis and mastoiditis will become much more of a clinical rarity than it is at the present time.

Discussion

Dr. Walter H. Fink: I should like to mention an eye finding mentioned by Dr. Boies, namely the sixth nerve paralysis. I have seen cases of several months standing that recovered fully without any permanent paralysis. I want to congratulate Dr. Boies.

Dr. Russell Morse: There are several ways one could visualize the petrous portion of the temporal bone. The two methods which are most satisfactory have been demonstrated in the roentgenograms which Dr. Boies has shown. In one of these the petrous portion was projected vertically through the top of the skull, the beam of X-ray being directed vertically through the head from below the chin. In the other, the petrous portion of the temporal bones was projected anteroposteriorly. These methods bring out in different planes the cells of the petrous portion of the mastoid bone and give us an accurate delineation of these cells.

I wish to congratulate Dr. Boies on the presentation of the group of symptoms which allows the identification of this condition as a clinical syndrome. From the routine examination of the badly infected mastoid in which pneumatization has extended into the petrous portion we find that these cells are always involved. In roentgenograms made after mastoid operation we often find cells remaining in the petrous portion of the mastoid.

This lesion from our standpoint is that although the involvement of these cells is a very common thing it may be a little unwise to do the radical operation necessary to remove these foci of infection until we get the clinical symptoms of their involvement.

Dr. L. R. Boies: I do not want to give the impression that this operation is necessary in all cases of Petrositis. Petrositis undoubtedly occurs as a complication to many ordinary mastoid infections and if a thorough simple mastoidectomy exposing all cell leads is done, the case will recover. When a case presents itself with evidence of Petrositis we invariably get key plates before operation to compare with subsequent plates if more alarming symptoms arise. It is only in the case where more serious symptoms develop unrelieved by mastoidectomy in which the more formidable operation on the petrous pyramid is necessary.

XANTHOMA ASSOCIATED WITH LIPEMIA

D. D. Turnacliff, M.D.

This boy came into the office about six weeks ago, my office girl spoke to him thinking it was the same boy I presented here about a year ago. He came in for another skin condition and, in looking him over, I found three xanthoma lesions. I went into the history and found that three years ago he was 5′ 2″ and weighed 182 lbs., and about that time the xanthoma lesions appeared. Somebody advised him to reduce and he had taken off weight to 155 lbs. I told him to put on four or five pounds in weight which he did. Then we had his blood fats checked. He had double the number of lipoids and double the amount of cholesteral. You may wonder, as I did, whether or not just putting on the weight in two weeks time would do that type of thing. About the same time I had a man weighing 320 pounds who had put on 30 pounds of weight in a month. I sent his blood in for checking and it was practically normal, just a little bit high. This lad has no hair on the body which is probably one of the signs of pituitary disfunction.

I am only presenting this case, along with the other one, as a matter of observation. It isn't that we know anything about blood fats or what controls them in the body. I have run on to one or two interesting things in the literature lately. One boy in California was given anterior pituitary like substance for undescended testicle and he was given enough so it developed a glycosuria which receded after injections were stopped. It brings out the possible relationship between pituitary and diabetes.

It is my impression that the development of these xanthoma lesions occurs at the heighth of lipemia when the blood fats force their way out through the capillaries and if the lipemia continues for a long enough time there probably would be a fibrosis around the xanthoma lesions and they become permanent. In the case I presented last year, the lesions have all disappeared.

Discussion

Dr. Walter H. Fink: Xanthalasma on the eyelids are frequently seen and in those cases, I always think of the possibility of diabetes. I wonder if you tested for diabetes in your cases and also, if you looked at the fundus.

Dr. D. D. Turnacliff: The eye grounds were not examined. Postmortems have been done on some of these cases and show the same condition throughout the bony structures and I would not be surprised if you would find some eye changes.

Dr. Edward T. Evans: Were there any bone findings in your case?

Dr. D. D. Turnacliff: This man was not X-rayed at all, the other man had no bone findings.

Dr. R. L. Wilder: The subject of the effect of pituitary extract on carbohydrate metabolism is very interesting. In the case cited by Dr. Turnacliff, where administration of antuitrin S. produced glycosuria, no permanent effect on the carbohydrate metabolism occurred. With cessation of treatment with antuitrin S. the glycosuria disappeared.

The pituitary effect on carbohydrate metabolism has been shown experimentally in dogs where diabetes, due to pancreatectomy, has been cured by removal of the pituitary. The pituitary effect is thought to be due to a lessening of sensitivity of the body to insulin.

Jas. K. Anderson, M.D.,
Secretary.

MINNESOTA STATE SANATORIUM CLINIC

February 8, 1936

Dr. Burns: Doctors and friends. Our clinic for this evening demonstrates the variety of non-tuberculous conditions coming in to a sanatorium, which, if the tuberculosis is to be treated effectively, must become a major element in such treatment. It may seem strange to many of the practicing physicians who are here tonight that we emphasize the coincidental diseases rather than tuberculosis, for which our patients were admitted. It is, however, the recognition of these conditions in the study of tuberculosis that makes the recognition and treatment of tuberculosis as a disease, as well as a public health problem, of great interest. Too often have we considered presenting symptoms indicative of hidden pathology of a tuberculous nature which if we further analyzed them would reveal non-tuberculous disease as a causative factor in the symptoms presented. Too often because of x-ray findings showing a minimal lesion have such presenting symptoms been interpreted as coming from such an origin when, as a matter of fact, the cause is in an entirely different organ and is due to pathology other than tuberculosis. Too often have we been willing to accept the diagnosis of tuberculosis rather than search diligently until proof that symptoms and disease coincide can be found. We hope that the presentation of diseases coincidental with but independent of tuberculosis will stimulate all of us to more diligent search and more careful consideration of this most interesting problem. We have enjoyed and profited from your discussion of our material in the past and hope that there will be as free an exchange of opinions relative to the questions raised during the course of this evening as there has been in the past.

The first clinic this evening will be given by Doctor Wilson.

ADDISON'S DISEASE AND ADRENAL TUMOR

Viktor O. Wilson, M.D.

Kepler, in writing on the diseases of the adrenal glands in July, 1935, outlined these diseases as follows:

I. Adrenal Insufficiency (Addison's disease)
    Pathology 1. Tuberculosis
        2. Simple atrophy
        3. Chronic inflammation (not tuberculous)
        4. Hemorrhage
        5. Neoplasm
        6. Extra-adrenal disease (neoplasm of the semilunar ganglion. Case of Bicknell)
II. Adrenal Hyperactivity
    Pathology 1. Tumors of the gland
        2. Hyperplasia
    A. Hyperactivity of Cortex
        1. Before puberty—pseudohermaphroditism
        2. After puberty—virilism (reversal of sex characteristics)
    B. Hyperactivity of Medulla
        1. Hypertension states.

This is essentially the same outline as followed by Hoffman while reviewing the status of the present knowledge of the adrenal gland in 1935. We are exceedingly fortunate in having two of these adrenal gland diseases to present to you tonight.

This is the case of a 47-year-old male patient who states that he has been sick for the past two years. During this period he has coughed and expectorated, yet has never spat blood. These symptoms have troubled him very little in the summer, but are aggravated in the winter when he perpetually feels cold and catches cold easily.

Early in the fall of 1935, he again caught cold and his cough and expectoration grew worse. About the same time as his cold appeared in the fall, he developed pains over his whole abdomen and in the small of his back. These pains were of a sharp, shooting nature but were transitory. One month after the onset of his cold, he began to vomit. The vomiting occurred without pain shortly after eating, and has persisted up to the time of admission. Constipation, which has been present for years, has increased until now he is compelled to have an enema or take a laxative daily. He gradually grew weaker and more tired until about two months ago when these symptoms became so marked that he was rendered helplessly bedridden. Weight loss began in the summer of 1935. By fall he had lost 30 pounds and in the past three months he has lost an additional 20 pounds in spite of bed rest. During December, he had one fainting spell, and again in January, 1936, he had two fainting spells, which occurred even though he was lying down.

One month after the onset of his cold in the fall, this patient consulted his physician and low blood pressure was found. An X-ray of the chest suggested tuberculosis and sputum tests demonstrated the presence of tubercle bacilli.

Physical examination of the chest demonstrated pathology typical of tuberculosis. This diagnosis has been otherwise confirmed so the coincident findings are the significant ones in this case report. The patient is lying on a stretcher and states that he is too weak to sit up, and that talking exhausts him. His head is partially bald and the scalp is dry and scaling. There is an irregular ink-black pigmentation of the lips which extends onto the buccal mucosa. These same colored areas are to be found mottling the tongue. Copper, keratotic plaques are seen on the left cheek. Somewhat in the axillary folds, and markedly about the elbows, knees and lateral malleoli of the ankles, also to some extent in the groin and about the face and neck are seen brownish, copper-colored areas of pigmentation of the skin. The skin over the whole body is dry and dehydrated. On examining the heart, the right border is found just to the left of the sternal margin and the left border is percussed three centimeters inside the nipple line. The maximum apex impulse is in the fifth intercostal space three centimeters to the right of the left nipple line. The heart tones are faint but clear. Systolic blood pressure is 80, and the diastolic 56. The abdomen is negative.

Laboratory examination of this patient showed a negative urine. Blood sedimentation shows a vertical curve. His hemoglobin was 64 per cent, red blood cell count 3,710,000, and white blood cell count 13,100. His basal metabolic rate was +1 per cent. Fasting blood sugar was 84.7 mgs. per 100 cc. and sugar tolerance examination showed an extremely flat curve indicating increased sugar tolerance. X-ray examination demonstrated findings characteristic of bilateral pulmonary tuberculosis, a normal sella turcica, and plates made of the adrenal areas failed to show any evidence of calcification.

Comment: The diagnosis in this case of Addison's disease is readily made clinically. The presence of pigmentation, gastro-intestinal disturbances, weakness, extreme loss of weight, and hypotension throws this case into the well defined clinical group that could have been recognized at any time since Addison wrote his original paper in 1855. The presence of tuberculosis, one of the causative diseases of adrenal insufficiency, further emphasizes that possibility. The laboratory findings of a medium low basal metabolic rate, which would undoubtedly have been lower had not the patient had one degree of fever at the time of examination, a blood sugar at the lower limits of normal and an increased sugar tolerance serve only to substantiate the clinical impression of this man's disease. Negative X-rays of the adrenal areas are only to be expected, for this man has not been ill long enough to develop calcification of his tuberculosis. The blood chlorides were not examined because this man was not in a state of crisis and no alteration from the normal was to be expected.

An interesting finding in this case of Addison's disease, which is usually not mentioned, is the presence of the inky-black pigmentation of the lips, buccal mucosa, and tongue. MacCullum, discussing endogenous pigments, mentions only that "Melanins may appear in various colors, but usually dark brown or black." Osler states that the pigmentation of Addison's disease may occur as black spots. Rogoff recently called attention to this black pigmentation and said, "the development of ebony-colored, small spots in a patient with Addison's disease is associated with irreparable damage to the cortex of the adrenals, and an inevitably fatal outcome may be expected to occur approximately six to eight months from the time of their appearance." Unfortunately, this patient does not know when this black pigmentation appeared; in fact, he did not even know it was present when asked about it.

At the Mayo Clinic, a suspected case of Addison's disease is placed on a salt-free diet and thrown into adrenal collapse as a diagnostic test. Further confirmation of the diagnosis in this case rests on the evidence that after the daily administration of 10 grams of sodium chloride, all nausea, vomiting and abdominal pain have disappeared, and he is now beginning to eat large meals.

This second case, transferred to the Minnesota State Sanatorium from one of the state hospitals, is that of a 27-year-old female who presents the following history of her present illness: Six years ago she had a "carbuncle" near the urinary outlet, as a result of which she became irrational and was admitted to the St. Peter State Hospital. After three months hospitalization she was discharged, but has never been well since. At about this time her voice became lower pitched, and she states that it is now definitely lower pitched than before. Also since that time she has what she describes as "nervous indigestion" and "gas on the stomach." With these exceptions, she has apparently been well until December 27, last. During that night she was awakened by a "pain or tickling" in the right chest. She coughed considerably, and, with difficulty, raised about a teaspoonful of blood. Since then she has lost two or three pounds in weight, suffers weakness and ease of fatigue and an exceedingly infrequent dry cough has persisted. She was diagnosed pulmonary tuberculosis and sent to the sanatorium.

Several facts in her systemic history are notable. Menses began at the age of 14 years, were profuse but regular once each month, and last six or seven days, until six years ago. At the time of her admission to St. Peter State Hospital her menses stopped entirely for three months. Since then she has noticed a very appreciable decrease in both the quantity and duration of the menses. She is 27 years old, unmarried, lives with her parents, and has very little association with young people. In the past six years there has been an increase in the growth of hair on her body.

Only those facts of physical examination which are of significance will be described. Examination of the lungs was entirely negative. Her body is of the hyposthenic type and of masculine angular contours rather than feminine curves. The skin over the whole body is of a coarse textured type. Hairy growth of the body follows that of a masculine type and distribution. The eyebrows are rather heavy and bushy. Her upper lip, chin, and cheeks are unusually hairy.

The forearms and thighs have a distinctly heavy growth of coarse black hair. Over the abdomen and back there is a growth of fine hair similar to that seen in young adult males. About the areolae of each breast there are coarse black hairs. Pubic hair is coarse and there is a triangular protuberance with hair running up to the umbilicus as is seen in the male. Over the labia majora there is an abundant growth of hair which continues posteriorly and encircles the rectum. Her breasts are small and atrophic. At the urethral meatus there is a bright red, pinhead sized remnant of a sensitive urethral caruncle. The clitoris is larger than normal, and the labia majora seems smaller than normal. On bimanual examination the cervix and uterus are small but within the limits of normal. The adnexal areas are negative. There is tenderness to very deep pressure in the right upper quadrant of the abdomen and similar tenderness posteriorly over the right kidney. Examination of the heart was negative and the blood pressure was found to be systolic 104 and diastolic 74.

On laboratory examination the patient was found to have a positive Mantoux test. Blood sedimentation was a normal horizontal line; hemoglobin 85 per cent; red blood cell count 4,210,000; and white blood cell count 7,300. Her urine was found to be negative. Fasting blood sugar was 80 mgs. per 100 cc.; and the sugar tolerance test was found close to normal limits. Her basal metabolic rate was minus eight per cent. X-ray of the chest showed negative lung fields, a normal sella turcica was found, and intravenous pyelograms were made.

Comment: This patient does not have tuberculosis. Her temperature and pulse are normal, physical and X-ray examinations of the lungs are negative. There is no leucocytosis and the blood sedimentation rate is normal. Sputum examinations are negative. With a positive Mantoux test we can satisfy only one of the diagnostic criteria of tuberculosis and a diagnosis of tuberculosis is, therefore, not tenable.

The significant findings in this case are low pitched voice, hirsutism, masculine body conformity with hypertrophy of the clitoris and recession of the female sex characteristics. Some of these findings are of minor extent while others are quite pronounced. We, of the staff of this sanatorium, believe that the weight of evidence in this case is in favor of virilism, or a reversion of the sex characteristics. Virilism is largely a clinical diagnosis and is indicative of tumor of the adrenal gland. Realizing that the differentiation of pituitary basophilism, virilism due to adrenal cortical tumor, adrenal cortical hyperplasia or arrhenoblastoma of the ovary may be very difficult, let us analyze further our evidence. This patient has tenderness to deep palpation in the right kidney region. Rogoff states that "tenderness to costolumbar pressure is indicative of acute inflammatory or degenerative processes of the adrenal gland." We have the further evidence revealed by intravenous pyelograms and X-rays of the kidneys. The right kidney is definitely at a lower position than normal and there is the constant appearance of a filling defect of the upper calyx of the right kidney as if flattened by external pressure. There is also a triangular shadow at the upper pole of the right kidney suggestive of an enlarged adrenal gland. Of course, the confirmation of the clinical diagnosis can only be made at operation and biopsy of the adrenal glands.

THE TREATMENT OF GENITO-URINARY INFECTIONS

F. W. Van Valkenburg, M.D.
Long Prairie, Minn.

During some of the urological consultations in this institution, the question of the treatment of urinary infections has arisen. This problem is a pertinent one for all general practitioners, and, for that reason, Dr. Burns felt that, even though there is no such case to be presented as a clinic tonight, a discussion of this subject would be of interest to all in attendance.

Pyuria, or the presence of pus in the urine, is merely a symptom and an indication of disease of the urinary tract. Normal urine contains from five to seven leucocytes per high power field, and any number greater than this is pathological. All specimens from females must be obtained by catheterization.

We will consider the sources of pyuria beginning at the distal end of the urinary tract. First, urethral and paraurethral sources: These demand search for evidence of persistence of infections, originally due to gonococcus, but followed by the ordinary pus-producing organisms, or there may have been a primary non-specific infection. Possible sources are hard or soft infiltrations of the urethra, infections of the glands of Littre and lacunae, Cowperitis, prostatitis and seminal vesiculitis, periurethral abscesses, et cetera. One of the most common sources of the persistence of pyuria is a chronic prostatitis, vesiculitis or an overlooked infiltration of the urethral wall. Strictures of the urethra respond to dilatation, but it should be remembered that such dilatation must be continued indefinitely at increasingly longer intervals. Prostatitis and vesiculitis will respond to biweekly massage which is best given in courses with a rest interval.

Second, vesical sources: It should always be remembered that a primary cystitis is very infrequent. Obstruction at the bladder neck can be found responsible for pyuria at all ages. The openings of diverticula should always be looked for, as they can be present in infants and children as well as in adults. Other common sources of vesical pyuria are granulomas, calculi, granular and similar types of chronic cystitis, new growths, multiple shallow diverticula and communications with perivesical foci of infection as rupture of appendiceal, tubo-ovarian and similar abscesses into the bladder.

Treatment of pyuria due to a vesical source rests upon an accurate diagnosis, and cystoscopy is an invaluable aid. However, much help can be obtained by other means, such as: measuring the residual urine in the bladder after the patient has voided, the use of sounds which will often disclose the presence of calculi, taking of bladder cystograms using both oblique and lateral views with a five per cent sodium iodide solution to determine the presence or absence of diverticula. Treatment of vesical sources of pyuria are best left to the specialist in that field, and will not be discussed here. It might be said that most calculi can be crushed with a lithotrite and removed, while most forms of bladder neck obstruction can be successfully removed with the trans-urethral instruments, thus obviating cystostomy with its long hospitalization.

Third, renal and ureteral sources: These are five in number, strictures, calculi, neoplasms, non-tuberculous infections and tuberculosis. The diagnosis of these sources of pyuria usually requires cystoscopy and pyelography, but considerable help may be obtained from the plain K. U. B. plates and intravenous urograms. The occurrence of ureteral strictures is probably less than it was thought a few years ago. When they are present repeated dilatations afford relief. It is commonly thought that renal and ureteral calculi give rise to symptoms indicative of their presence, but it should be remembered that only when they move do they cause pain, and that infection, which is always present with these calculi, may be the only symptom of their presence. Neoplasms usually manifest themselves by the occurrence of hematuria, but at times they may also be the cause of pyuria. Cystoscopy and pyelography are necessary in their diagnosis unless the growth is palpable and its character quite evident. In the diagnosis of non-tuberculous infections it is not enough to determine its presence, but the localization and estimation of the degree of damage is of considerable importance. In rare instances this information can be obtained from intravenous urograms, but usually cystoscopy and pyelography are necessary. The three common causative organisms in order of their importance are bacillus coli, staphylococci and streptococci. If identification of the offending organism can be determined by cultural methods it is of great aid in treatment.

The drugs used in the treatment of kidney infections are almost innumerable, but the majority of them are not efficacious. Hexamethylenamine is undoubtedly the most efficient and least expensive of all of the so-called urinary antiseptics. It can also be used intravenously and is dispensed for that purpose in 31 grain ampoules. Alternate alkalinization of the urine with potassium citrate and acidification, combined with the use of hexamethylenamine, is curative in many uncomplicated cases. The intravenous use of 0.3 grams of neosalvarsan is of value in those cases due to infection by the coccus group. The ketogenic diet is used in those cases resistant to the ordinary methods of treatment. Pelvic lavage and the indwelling catheter are often used in the acute fulminating cases. The majority of tuberculous kidney lesions manifest themselves by disturbances of the act of urination, but, in many instances, there is only a symptomless pyuria. Frequently the disease is bilateral and fairly well advanced when first seen, and these cases will only obtain benefit from the regimen accorded the treatment of tuberculosis elsewhere in the body. The diagnosis of early renal tuberculosis is seldom made without the use of cystoscopy and the taking of several pyelograms. When the diagnosis can be made and the disease is unilateral, removal of the kidney is definitely indicated. The usual case of renal infection which shows recurrences or poor response to treatment should have repeated examinations of the urine for the presence of tubercle bacilli.

THYROTOXICOSIS ASSOCIATED WITH PULMONARY TUBERCULOSIS

Edwin J. Simons, M.D.

This is the case of a white, male patient 36 years of age. He was admitted to the sanatorium on March 8, 1935, with cough, expectoration, loss of weight and rapid pulse as his principal complaints. Though he had pleurisy prior to 1928, it was that year that he first went to see a physician to determine why he became tired so easily. An X-ray taken then showed changes characteristic of pulmonary tuberculosis. He gave up the heavier duties of farm work, yet, in spite of his lessened activity, he lost 40 pounds in weight from 1928 to 1933. Since the spring of 1934 he has coughed and expectorated, has had fever, night sweats and pain in the right chest. His pulse rate, he states, has been much faster than it was prior to his present illness. Also he has noticed hoarseness intermittently over a period of two years.

His physical examination brought out signs typical of pulmonary tuberculosis with cavitation in the right upper lobe. These included supra- and infra-clavicular retractions, impaired resonance, medium coarse apical rales, and increased transmission of whispered voice. In addition to these pulmonary findings, slight prominence of the eyes was noted, though other eye signs were absent. On palpation, the right lobe of the thyroid was found to be twice the size of the left lobe. No bruit was heard or thrill palpated. Cardiac examination states that the rate was rapid but regular, and describes a loud systolic murmur heard best at the apex. Also the notation is made that the apex beat was diffuse and the heart hyperactive. The only other fact of interest in the examination was the presence of a fine tremor of the fingers.

Other diagnostic procedures demonstrated the following facts: Interpretation of the X-ray films of the chest concluded that the mottling and cavitation seen in the apex, first, third and fourth interspaces on the right side were characteristic of active pulmonary tuberculosis. Tubercle bacilli were seen in all specimens of sputum, both on direct smear examination and in the hydrocarbon flotation test. These findings absolutely confirmed the diagnosis of active, moderately advanced, unilateral pulmonary tuberculosis. Artificial pneumothorax was instituted but on the fourth effort to refill the space, no cavity could be found. Additional attempts were made but the procedure had to be abandoned as unsuccessful.

Repeated basal metabolic tests done over a period of three months varied from plus 47 to plus 57 per cent, the average being plus 52 per cent. During this period his tuberculosis had improved slightly and he had gained 12 pounds in weight. However, the last basal metabolic test was the highest and his thyrotoxicosis appeared clinically to be increasing. Surgical intervention seemed advisable and a subtotal bilateral lobectomy of the thyroid was performed. The pathologist's conclusion was "diffuse hyperplasia of the thyroid; exophthalmic goitre."

He made an uneventful recovery and six weeks later the basal metabolism test gave a reading of minus nine per cent. Two months after thyroidectomy he began to have pulmonary hemorrhages and these continued intermittently for two weeks. Through these hemorrhages, as demonstrated by an X-ray taken shortly after the last one, the pulmonary tuberculosis showed an extension of the disease on the right side and involvement of the left lung. Six months after thyroidectomy the basal metabolism increased to plus 34 per cent.

This case was suggested by Doctor Burns because it embraces several questions which are encountered by all general practitioners. Among these are the differentiation of tuberculosis and exophthalmic goitre, treatment of hyperthyroidism with iodine in tuberculous subjects, the use of iodine in hyperthyroidism unassociated with tuberculosis, pre- and post-operative use of iodine, employment of radium and X-ray as a substitute for surgery, operative results in goitre cases with tuberculosis.

In many cases great nicety of judgment is required in differentiating the two diseases or in diagnosing hyperthyroidism as a complication of tuberculosis. Crile states that in his series of hyperthyroidism cases, there has been no case in which tuberculosis has appeared after hyperthyroidism was established—the sequence appears to be the other way, namely: hyperthyroidism appears in the course of tuberculosis. Further, Crile states, "In the early stages the clinical pictures presented by these two conditions are almost identical; they include tachycardia, flushing of the skin, sweating, nervousness, tremors, digestive disturbances, loss of weight, dilated pupils, keen intellect, exaltation of the emotions, vivid personality. If one were to eliminate just a single feature of pulmonary tuberculosis, that is, the lesion in the lungs, it would not be possible to differentiate either of these conditions from the other. That is, when tuberculosis and hyperthyroidism are associated in one patient the symptoms of each overlap those of the other." Four measures are vital to the correct differentiation of the two disease-states, Mantoux and sputum tests, thoracic X-ray films and basal metabolic tests. Metabolic studies may be influenced by body temperature and this may lead to confusion. Reinhoff states that while the hyperthermia usually is confined to 99 or 100 degrees, occasionally the temperature found in hyperthyroid cases may reach 102 or 103 degrees. DuBois recently has pointed out that for every degree of body temperature above 98.6 the basal metabolism is elevated 7.2 per cent. It is sometimes necessary in tuberculosis patients with fever to adjust the basal metabolic readings according to this rule to arrive at the correct elevation of basal metabolism due solely to the thyrotoxic state.

For many years the teaching has been popular that the use of iodine in the presence of pulmonary tuberculosis is contraindicated. Proliferation of fibrous tissue is part of the pathological picture in tuberculosis. Sollman states that the iodides lead to the absorption of connective tissue. Osborne points out that the iodides stimulate the tuberculous process and may cause a rapid breakdown of the tubercles and consequently a dissemination of the tuberculous infection. Sorel found that the iodides hasten death in experimental tuberculous infection in guinea-pigs. Recently, however, Vinson has maintained that the use of lipiodol, where necessary in tuberculous subjects for differential diagnosis, does not have a deleterious effect on the tuberculous process. Also, cautious use of various iodides for intravenous pyelograms does not lead to harmful effect on the pulmonary lesions. Nevertheless, the prolonged treatment of hyperthyroidism with the iodides when complicated with tuberculosis should be guarded.

In 1930 Thompson and collaborators reported the result of treating 14 mild and 10 severe or moderately severe cases of exophthalmic goitre with iodine over periods varying from two weeks to three years. These cases were treated, with but few exceptions, with small doses varying from 1/5 to 5 drops daily of compound solution of iodine. In the introduction to the work he mentions numerous other investigators who previously had made observations on cases so treated. While his conclusions fail to advocate such treatment he does remark, "If the disease is mild, however, the patients often respond satisfactorily and in some patients it terminates. The proportion of unsatisfactory results in Boston appears to be so small that it is not a contraindication to prolonged treatment with iodine if strictly confined to mild cases and if the patients are kept under close observation." Wolcott, Starr, Segall, and Means report successful treatment in 92 per cent of their hospital cases, but add that its benefit is only temporary. Lahey states that at their clinic not a single cure has been obtained by the prolonged use of iodine. This matter has been brought up for its usefulness in the treatment of those cases in which operation is impossible for various reasons. In tuberculosis the use of such small quantities of iodine even over prolonged periods might not be harmful to the tuberculous lesion, and a patient may be so controlled until operative intervention is possible.

It was Plummer who first used Lugol's solution post-operatively. The results were so spectacular and consistent that its use preoperatively was instituted. From this time on the operative mortality has decreased so decidedly that now preoperative preparation of the patient with Lugol's solution is practically universal. The dosage varies according to the operator, 30 to 45 drops being the most frequent daily quantities, the range being from 1/5 of this amount in some German clinics to three times these quantities in crises. According to Shirer, a period of seven to 14 days is required for the maximum benefit, at which time operation should be performed. Regarding refractoriness to iodine, Thompson finds it necessary to stop treatment for three or four weeks until the refractoriness shall have disappeared. In one case refractoriness disappeared in 24 days, though the exact time of restoration of iodine-response has not been determined.

In the case now under discussion 10 drops of Lugol's solution were given for eight days preceding operation. While it is customary to give Lugol's solution post-operatively in amounts varying from 15 to 45 drops a day for from three to 30 or more days, this case was given 15 drops a day for eight days and five drops a day for three additional days. Originally it was used to prevent post-operative crises while later the Lugol's solution was used to prevent hyperplasia of the unremoved thyroid tissue. Recently, however, Thompson has shown that the post-operative administration of iodine does not prevent the regeneration of thyroid tissue or a persistence of thyrotoxicosis. Recurrences of the disease he believes are caused in most cases by the removal of too little tissue at the time of operation. Nevertheless, he concludes also that "owing to the propensity of the remnant of thyroid tissue to regenerate shortly after operation in some cases, it is probably impossible at present to prevent a certain amount of persistence of the disease no matter how complete the thyroidectomy nor by whom it was performed." Particularly applicable to the case at hand is his opinion that it is desirable to reoperate on all patients in whom the basal metabolic rate can not be held at or near the standard normal level by the continuous administration of iodine until the disease disappears. These cases often respond to the continued use of the iodides.

Occasionally the widespread tuberculous infection militates against thyroid surgery when the two diseases appear concurrently in the same subject. As mentioned before, it is this fact which makes the use of small doses of iodine an acceptable procedure in some cases, and leads to the consideration of radium or X-ray as curative measures. Stenstrom at the University Hospital has had some encouraging results from irradiation of pathological thyroids. Morsman also advocates irradiation in exophthalmic goitre. Portmann of the Crile Clinic states that the hyperplastic non-toxic goitre of adolescence "should not be treated by radiation," that simple colloid non-toxic goitre "is not benefited by radiation," that radiation is likewise contraindicated in non-toxic adenoma of the thyroid.' On the other hand, he believes that toxic hyperplastic or exophthalmic goitre, characterized by diffuse hyperplasia and symptoms of toxicity, is amenable to radiation therapy but the results to be expected are unrelated to the severity of the symptoms, and that the "treatment of adenomatous goitre with toxic symptoms by radiation gives satisfactory results by reducing the toxicity" though the size of the adenoma may not be decreased, and the response is less spectacular and slower than that seen in exophthalmic goitre. He further summarizes by remarking, "An extensive review of the literature shows that the average results which have been obtained by radiation therapy for hyperthyroidism may be arranged as follows: Cured and improved 75 to 80 per cent, recurrences or unimproved 15 per cent, mortality including all patients who have died of the disease after having been subjected to radiation therapy, five to ten per cent." These results do not pertain to tuberculous subjects with hyperthyroidism. However, they do suggest that radiation therapy might prove effective if thyroidectomy is contraindicated by the pulmonary tuberculosis.

The final point of interest to be discussed is the relationship of the thyrotoxicosis and its surgical treatment to the pulmonary tuberculosis. It is frequently pointed out that in the aged in whom the metabolic demands are decreased, tuberculosis often runs a prolonged and benign course. During the past few years the eastern school has suggested that thyroidectomy sufficiently reduces the metabolic needs of the patient with decompensated heart, that compensation is restored. So it was interesting, first, to observe the results of the operative procedure upon the tuberculosis, and secondly, to see what effect the lowered basal metabolic rate might have on the patient's tuberculosis. Regarding these points Crile says, "When hyperthyroidism is superimposed on tuberculosis which is already driving the energy system continuously, the patient is suffering from a double menace. *It occurred to us, therefore, that thyroidectomy would do for the treatment of tuberculosis what rest does.* In short, we believed that a patient who is fighting a battle against two serious diseases might win the more easily if we took away one of them. Therefore, during the past ten years we have performed thyroidectomies on 87 patients who had these two diseases with the following clinical results: In the cases in which the presence of pulmonary tuberculosis was definitely confirmed by X-ray examination, 74.5 per cent have shown definite clinical improvement following the thyroidectomy. Of the cases in which we have been able to secure a postoperative roentgenogram, 82 per cent show improvement in the pulmonary lesions, while in 35 per cent the lesion has been cured."

In the case at hand, operation was borne well. The pulmonary hemorrhages which occurred two months after the operation do not appear attributable to operation, though this may be a debatable point. His basal metabolism taken just before the hemorrhages was minus 9 per cent. Shortly after the extension of his tuberculous disease, a recurrence of the hyperthyroidism appeared, and for this reason clinically it was thought attributable to the tuberculous manifestations. At present he is responding to iodine medication, as advocated by Thompson, yet if or when this proves ineffective radiation therapy will be employed only if surgery is impossible. So far this case has not conformed with the hopes of the staff or the expectation expressed by Crile, that thyroidectomy would sufficiently decrease energy demands of the organism to materially improve the prognosis of the pulmonary tuberculosis. Nevertheless, it is hoped that other observations along this line can be made.

CARDIAC CASES ADMITTED RECENTLY

Hilbert Mark, M.D.

It is not many years ago that a comparatively high percentage of cases with mitral stenosis were admitted to sanatoria as tuberculous due to the association of hemoptyses with such lesions. Within six months two cardiac cases with persistent hemoptyses were admitted to the sanatorium as tuberculous patients. Within a 30 day period, recently, two cases of mitral disease and one of aortic dilatation were admitted. The last two cases had pulmonary tuberculosis also. Since such cases are of interest to all general practitioners, Doctor Burns felt that a brief resumé of their salient features would be worthy of presentation.

The first case is that of a 39-year-old female, who first began to cough and expectorate in 1925. These symptoms have continued unabated since then. Since that time she has also slowly lost weight, gets short of breath on exertion and becomes tired easily. During 1928 she has intermittently had pains in her left chest and has constantly been annoyed by the coldness of her hands and feet. For three or four months prior to admittance, she has coughed and spit blood. This has been continuous and increasing for the last month before her hospitalization, whereas, before then, it was periodic. Frequently, she has had spells of dizziness, and occasionally, "things have turned black" before her eyes. Her heart often palpitates and infrequently it seems to miss a beat. Always the pain in her left chest is in the region of her heart.

Her past history brings out the fact that at the age of eight or nine years, following scarlet fever, she had chorea for several months. At least once and usually several times each winter from 1914 to 1922, when she had a tonsillectomy performed, she has had tonsillitis. In previous years, rheumatism has involved both shoulders and the left knee. She has had frequent periods of epistaxis in the past.

On physical examination no pulmonary pathology could be demonstrated. There is a cyanotic flush to each cheek and the lips are of a faintly bluish-red tint. The pulse rate varies from 70 to 80 and the pulse rhythm is regular. Pulsations of the heart are visible from the second intercostal space downward over the left lower chest. A sharp, distinctive and forceful pulsation was visualized in the sixth intercostal space two centimeters beyond the nipple line. On percussion, the right heart border was within normal limits yet the left heart border was markedly displaced to the left. Palpation revealed a diastolic thrill palpable only in the apical region of the heart, and a forceful "tapping" apical impulse. On auscultation, the accentuated first sound at the apex was distinctly audible. This was preceded by a short, faint, diastolic murmur. Neither the accentuated first sound nor the diastolic murmur were transmitted but were heard slightly to the right of the left apical border. Also the pulmonic second sound was markedly louder than the aortic second sound.

Roentgenographic examination showed a definitely increased transverse diameter almost exclusively on the left side from the apex to the sternal end of the first intercostal space. Such a shadow indicates an enlargement of the left ventricle and auricle, and the pulmonary artery with a slight protrusion to the right of the right auricle or right ventricular infundibulum. Esophagograms show displacement of the esophagus to the right and posteriorly confirming left atrial enlargement. This, Rigler believes, is pathognomonic of mitral disease.

In summarizing the physical findings indicative of a stenotic lesion of the mitral valve, the following should be listed: a diastolic thrill palpable only in the region of the cardiac apex; an accentuated apical first sound preceded by a diastolic murmur, not transmitted; an accentuated pulmonic second sound; and roentgenographic enlargement of the left auricle and ventricle as well as displacement to the right of the right auricle.

The second case is that of a white, female, 28 years old, who presents the following history of her present illness: She was perfectly well and healthy until the spring of 1927, when she caught cold and began to cough. During the fall of 1927, expectoration started and soon amounted to one-half of a cupful. Now, in spite of the fact that the cough has persisted, she raises only one-fourth of a cupful each day. Usually, this is raised soon after she awakens and the balance of the day she does not cough. There has been no change in these symptoms for the past three years. In 1930 she developed a pain in the left side of the chest. For two weeks, through which time this pain lasted, she had a fever. In 1932, she had a hoarseness of the voice due, she was told, to a tumor of the throat which was removed by cautery. Following this there has been no recurrence of the hoarseness. Ever since the pleurisy she has had palpitation of the heart, and, for the past year, this has gradually grown worse. Also, during the past year, shortness of breath appeared and has grown steadily worse. Her weight has decreased ten pounds in 12 months and her appetite has been very poor. Just before her sanatorium admittance she had epistaxis for ten minutes each evening for two weeks. Her past history is significant in that it tells of an arthritis which moved about from joint to joint lasting about one year, ending seven years ago.

On physical examination the sclerae of both eyes are found to be icteric. In fact, this same icteric tint is to be found over the whole skin surface. Pulsations of the vessels of both sides of the neck are visible. Fingernails are of watch crystal shape, but fingers or toes are not clubbed. Radial pulses were totally irregular, but now have regained normal rhythm. The legs are cyanotic and there was at first very slight pitting edema. The liver border was at first palpable three centimeters below the costal margin on the right. It is now barely palpable. Examination of the heart shows the entire precordium pulsating. Broadbent's sign, retraction of the eleventh and twelfth intercostal spaces posteriorly, which is indicative of adhesive pericarditis, is well demonstrated. The maximum apex impulse is found in the mid-axillary line in the seventh intercostal space. Palpation elicits a pronounced thrill best felt in the apex but radiating laterally to the axilla and scapular area. On percussion the note over the entire left hemithorax is so impaired that no cardiac border can be outlined. Auscultation shows a loud systolic murmur best heard at the apex. It obscures the first sound and is transmitted to the axilla and lower scapular angle. A pericardial friction rub is heard also over the precordium. Crepitant and moderately coarse rales were heard at the right base upon admittance, and these together with the impaired note of the left chest, constitute the principal pulmonary findings.

Roentgenographic examination of the chest showed a dense opacity obliterating all detail of the left side. On the right side is seen a dense mottled type of opacity extending along the interlobular fissure from the hilum to the costal margin in the second intercostal space. There is also mottling from the fourth rib to the base. Esophagograms show the trachea pulled to the right in its upper extent but displaced posteriorly and to the right over its lower two-thirds.

This case is representative of patients with mitral disease having the dominant features of regurgitation. White states that usually both stenosis and regurgitation are present in some degree in all such cases, yet the stenotic characteristics may predominate in one, as it did in the first case presented, while features of regurgitation are accentuated in others, as in this case.

History of arthritis places the etiology in the rheumatic group of factors. Her Wassermann test was negative. Esophagograms demonstrated according to both White's and Rigler's criteria that it was a mitral type of roentgenographic enlargement. Osler states that liver engorgement with icterus is not uncommon in these cases. Pulsations of the neck vessels are seen in mitral regurgitation when the pulse becomes irregular, according to Hirshfelder. Marked displacement laterally of the maximum apex impulse suggests the mitral regurgitation. Most significant is the loud systolic murmur obscuring the first sound, heard best at the apex but transmitted to the axilla and scapular angle.

Briefly, the findings suggesting regurgitation through the mitral valve are: a systolic thrill best palpated at the apex but transmitted laterally to the axilla and scapular region; a systolic murmur heard best at the apex and transmitted to the axilla and scapular area; mitral type of roentgenographic enlargement of the cardiac shadow.

The third case is that of a 46-year-old Indian female. Her history of tuberculosis began with a pleural effusion 15 years ago. About 1200 cubic centimeters of fluid were removed. She has coughed and expectorated intermittently since then, the first streaks of blood having appeared in the sputum nine years ago. Tubercle bacilli were found in the sputum at this time, as a result of which finding she spent nine months in a sanatorium. In 1933, she again spent 11 months in a sanatorium. During December, 1935, she caught cold, her cough and expectoration increased, she developed fever and pains in the left chest, she lost weight and noticed that she became tired very easily. In addition to these symptoms, she has noticed that she is short of breath, and becomes dizzy upon standing up suddenly. Her past history describes illness from typhoid and pneumonia but no evidence of tonsillitis, rheumatism or chorea.

Physical examination of the thorax demonstrated findings consistent with a diagnosis of pulmonary tuberculosis involving the right lung extensively and the apex of the left lung. These findings are suggested by the previous positive diagnosis of pulmonary tuberculosis, and therefore, were not of unusual interest. However, examination of the heart demonstrated a systolic murmur heard from the right third rib at its sternal juncture upward along the right border of the sternum and in the large vessels of the neck. Also, in this same location, is to be palpated a systolic thrill. These two findings suggest the diagnosis of aortic stenosis. With this diagnosis percussion should demonstrate left ventricular hypertrophy. This is shown in displacement of the maximum apex impulse and the left heart border downward and to the left. In this case the maximum apex impulse and the left heart border are both within normal limits but the right heart border can not be defined by percussion due to impaired resonance over the right base. In this respect the X-ray film of the chest is very helpful in showing the heart moved over into the right chest and a marked increase in its transverse diameter.

However, even with these, the triad mentioned by White: murmur, thrill and small pulse, has not been completed. In fact, the pulse in this case is of normal volume and the blood pressures of both arms is equal, a point opposed to aortic aneurysm, one of the other pathological states entering in the differential diagnosis. In aortic stenosis the diastolic pressure is elevated and the systolic only slighty increased (according to Hirshfelder 130 to 160 mm. mercury) giving a low pulse pressure. In this case the diastolic pressure is practically normal, and the systolic pressure elevated, thus giving a high pulse pressure and a normal pulse volume, as found. One of the other conditions entering into the differential diagnosis is dilatation of the aorta. That this is the true cause of the murmur and thrill, is proved both by fluoroscopy and by the roentgenogram. Interest in the case arises from the fact that the systolic murmur and thrill heard best in the aortic area and transmitted to the great vessels, so characteristic of aortic stenosis, do not prove such a diagnosis without the small pulse and other proof.

As White has stated, the triad of findings, aortic systolic thrill and murmur and small pulse (due to low pulse pressure) are pathognomonic of aortic stenosis.

NEWS ITEMS

Dr. A. F. Branton, Willmar, Minn., is the new president of the Minnesota Hospital Association.

Dr. T. J. Kargacin, Anaconda, Mont., is spending a few months in Chicago, taking a postgraduate course.

Dr. H. D. Jenckes, one of the pioneer physicians of Pipestone, Minn., passed away recently after a long illness.

Dr. J. A. Malmstrom after serving for many years as health officer at Virginia, Minn., has returned to his private practice.

Dr. L. G. Leraan, a graduate of the University of Minnesota, has opened offices for general practice at Sioux Falls, S. D.

Dr. John Hynes, a recent graduate of the University of Minnesota, has opened offices for general practice at Billings, Mont.

Dr. and Mrs. E. M. Larson, Great Falls, Mont., have returned home, after spending the winter months in the Hawaiian Islands.

After spending four months in post graduate work in California, Dr. F. J. Roberts is back at his offices at Hot Springs, S. D.

Work on the new Indian hospital at Sisseton, S. D., has been started, and it is planned to have it ready to occupy in the early fall.

Dr. W. R. Kostick, a recent graduate of the University of Minnesota, has opened offices for general practice at Robbinsdale, Minn.

Dr. W. B. Warner, who has been in active practice at Wimbledon, N. D., for over forty years, passed away recently from a sudden heart attack.

Work is under way for the construction of the $100,000 Rice Memorial hospital at Willmar, Minn., which will be ready for dedicating in the early fall.

Dr. John H. J. Upham, Columbus, Ohio, was elected president of the American Medical Association at its annual meeting held at Kansas City, last month.

Dr. V. S. Counseller, Rochester, Minn., has sailed for Europe, where he will spend several months in Scotland, Germany, Switzerland, France, etc.

Bowbells, N. D., has secured the services of a new physician, as Dr. C. G. Wingquist, formerly of Carlton, Minn., has opened offices for general practice.

Dr. Charles A. Erdmann, professor of anatomy at the University of Minnesota medical school for 43 years, will retire at the end of the present school year, June 30.

Dr. Michael H. Eagan, aged 74 years, of Sioux Falls, S. D., died at a Chicago hospital recently after a short illness. Dr. Eagan was a graduate of Hamline University.

Dr. W. A. Byrnes, aged 45 years, and a former resident of Minneapolis, died on May 14, at San Diego, Calif. Dr. Byrnes was a graduate of the University of Minnesota.

Officers of the Montana Tuberculosis association recently elected are: Drs. E. M. Larson, Great Falls, president; W. E. Pierce, Butte, J. X. Newman, Butte, vice-presidents; and T. O. Hammond, Helena, secretary.

Good Friday brought good news to more than 200 patients of Dr. M. M. Hursh, veteran Cohasset, Minn., physician, who announced cancellation of accounts totaling $50,000.

Dr. R. Leland, a well known physician throughout southern Minnesota, passed away last month at his home at Kenyon, where he had been in active practice for over fifty years.

Dr. I. J. Bridenstine of Terry was elected president of the Eastern Montana Medical association. Dr. W. J. Craig, Circle, vice-president, and Dr. M. D. Winter, Miles City, secretary.

Dr. C. E. K. Vidal, Galen, Mont., who was seriously burned when he accidentally fell into a bonfire, is on the road to recovery, and will soon be able to resume active practice.

The Southern Medical Society held its annual meeting at LaMoure, N. D., recently and elected officers as follows: Dr. C. H. Sherman, Oakes, president; Dr. Samuel Miller, Ellendale, secretary.

Completing half a century of active service as a physician, Dr. P. C. Pilon of Paynesville was honored at a testimonial dinner given by 150 friends from several Minnesota communities.

Pleading guilty to a charge of practicing medicine without a license, Ramon Desilvio, who claims to be of Ethiopian descent, was sentenced to serve one year at the St. Louis county (Minn.) work farm.

Dr. H. E. Michelson, Minneapolis, was the guest speaker at the April meeting of the Aberdeen, S. D., Medical Society, his subject being, "Diagnosis of Common Skin Diseases," with illustrative slides.

The Northern Minnesota Medical Association will hold its annual meeting at Fergus Falls, on August 31 and September 1. For information as to details, write the secretary, Dr. O. O. Larsen, Detroit Lakes, Minn.

A survey to determine and correct sources of contamination in South Dakota municipal water supplies is being started this month by the State Board of Health, with employment of two assistant sanitary engineers.

Dr. Myron O. Henry, Minneapolis, was the guest speaker at the meeting of the Nebraska State Medical Society held at Lincoln, Nebraska, on April 9. The subject of his talk was "Treatment of Fractures of the Spine."

Dr. Albert Heising, a former well known physician of Red Wing, Minn., died recently at a St. Paul hospital after a short illness. Dr. Heising had been in active practice of medicine at Menomonie, Wisconsin, for several years.

Dr. Jessie E. Stubbs, one of the well known physicians of Hot Springs, S. D., passed away last month after a illness of several months. She was always very active in religious, social and civic matters, and will be sadly missed in that city.

Dr. E. A. Johnson, Watertown, was elected president of the South Dakota Academy of Ophthalmology and Otolaryngology Society. Dr. F. C. Nilsson, Sioux Falls, vice-president, and Dr. H. L. Saylor, Huron, was re-elected secretary.

Officers of the Women's Auxiliary to the Olmsted - Houston - Filmore - Dodge county, Minn., Medical Society are Mrs. F. A. Figi, Rochester, president; Mrs. C. E. Bigelow, Dodge Center, vice-president; Mrs. B. F. Smith, Rochester, secretary.

The Red River Valley Medical Society held its annual meeting last month at Crookston, Minn., with a large attendance of members and visitors. Dr. W. T. Peyton of the University of Minnesota, presented an illustrated address on "Tumor of the Breast."

Winners of the golf prizes at the annual meeting of the North Dakota Medical Association, held at Jamestown last month, were awarded to Drs. Geo. Holt, Jamestown; A. R. Sorenson, Minot; V. O. Ferguson, Gackle, C. E. Stackhouse, Bismarck, and R. W. Pence, Minot.

Dr. Charles H. Mayo of Rochester was named professor emeritus in the department of surgery at the University of Minnesota by the university board of regents. Dr. Mayo has been professor of surgery without salary on the university medical staff since 1919.

Seventy-five members of the Upper Mississippi and St. Louis County Medical Societies, held its annual meeting at Aitkin, Minn., last month. Addresses were made by Drs. Kerlan, Aitkin; Hawkinson, Brainerd, and Fischer, Davis, Miner, Hedberg and Gillespie, of Duluth.

Dr. S. A. Slater, Worthington, superintendent of the Southwestern Minnesota sanatorium, was re-elected to a two-year term on the board of directors of the National Tuberculosis association, at the recent annual meeting of the association in New Orleans, La.

A radio program "Men in White" of great interest to the medical profession throughout the country, is being sponsored and produced by the Minneapolis Council of Social Agencies over WTCN. The program will be presented each Thursday evening at 8:30 P. M. and will continue for 13 weeks.

Dr. James W. Brown, a recent graduate of the School of Medicine at the University of Minnesota, and son of Dr. E. D. Brown of the Department of Pharmacology, has recently located in Whitefish, Montana. Dr. Brown had a very fine record in Medical School and in the Minneapolis General Hospital and the St. Cloud Hospital, where he took his internship.

Dr. Chester A. Stewart of the department of pediatrics of the University of Minnesota and Mrs. Stewart, will go abroad in August. They plan to visit in England, Spain, France and the Scandinavian countries before going to Italy. In Rome Dr. Stewart will attend the international meeting of pediatricians and will conduct a panel discussion of childhood tuberculosis at the convention.

At the annual meeting of the South Dakota State Medical Association held at Sioux Falls last month, new officers elected are: Dr. J. L. Stewart, Nemo, president; Dr. E. A. Pittenger, Aberdeen, president-elect; Dr. J. F. D. Cook, Langford, vice-president and secretary, and Dr. B. A. Dyar, Pierre, executive secretary for the Allied Council. The 1937 annual meeting will be held at Rapid City.

At the annual meeting of the Hennepin County Medical Society held last month, new officers were elected as follows: Dr. J. H. Simons, president; Dr. F. G. Benn, first vice-president; Dr. C. E. Proshek, second vice-president; Drs. W. H. Aurand and C. J. Ehrenberg, executive committe; Drs. R. P. Head and O. W. Yoerg, board of censors; Drs. F. A. Erb and R. T. LaVake, board of trustees; Drs. Martin Nordland and J. S. Reynolds, ethics committee.

North Dakota Medical Association will hold its annual 1937 meeting at Grand Forks. The meeting held at Jamestown on May 17-19, was one of the largest and best ever held. The new officers are: Dr. W. A. Gerrish, Jamestown, president; Dr. E. L. Goss, Carrington, president-elect; Dr. W. H. Long, Fargo, first vice-president; Dr. L. B. Greene, Edgeley, second vice-president; Dr. A. W. Skelsey, Fargo, secretary, and Dr. W. W. Wood, Jamestown, treasurer.

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Tuesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: June 2nd, "Clothing and Health"; June 9th, "The Liver Treatment of Anemia"; June 16th, "The Expectant Mother"; June 23rd, "Adult Education"; June 30th, "Carbohydrates and Dental Caries."

The annual meeting of the Minnesota Radiological Society was held in connection with the meeting of the Minnesota State Medical Association at Rochester, Minn. The Russell D. Carman Memorial Lecture was delivered by Dr. Willis F. Manges, Philadelphia, on the subject, "Foreign Bodies and the Use of X-ray Examination in their Localization and Removal." At the annual dinner Dr. Manges addressed the members of the Society on "The Future of Radiology." Election of Officers for the coming year resulted as follows: President, Dr. J. Richards Aurelius, St. Paul; vice-president, Dr. Walter H. Ude, Minneapolis; secretary-treasurer, Dr. Leo G. Rigler, Minneapolis.

Dr. Elias P. Lyon, since 1913 professor of physiology and dean of the University of Minnesota School of Medicine, will retire from the faculty June 30. Dr. Lyon, who is 68 years of age, received the honorary degree of doctor of medicine from St. Louis University in 1910. He taught at Hillsdale College, Harvard School, Chicago, and Bradley Polytechnic Institute, Peoria, Ill. He became assistant professor at Rush Medical College in 1900. This position he held until 1904, carrying concurrent appointments of assistant professor of physiology and assistant dean at the University of Chicago from 1901 to 1904. He was professor of physiology at St. Louis University School of Medicine from 1904 to 1913 and dean from 1907 to 1913. In the latter year he went to the University of Minnesota School of Medicine as professor of physiology and dean. Dr. Lyon was president of the Association of American Medical Colleges in 1913.

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J. F. D. COOK, M.D.	Langford

COMMITTEE TO MEET WITH ALLIED GROUP

N. K. HOPKINS, M.D.	Arlington
E. A. PITTENGER, M.D.	Aberdeen

BOARD OF MEDICAL EXAMINERS

S. M. HOHF, M.D.	Yankton
S. F. HOWE, M.D.	Deadwood
J. D. WHITESIDE, M.D.	Aberdeen

SUB-COMMITTEE ON LEGISLATION

J. O. F. KRAUSHAAR, M.D.	Aberdeen
W. A. BATES, M.D.	Aberdeen
P. B. JENKINS, M.D.	Pierre

SOUTH DAKOTA STATE MEDICAL ASSOCIATION IN FIFTY-FIFTH ANNUAL SESSION

Sioux Falls, S. D.

MINUTES OF COUNCILOR'S MEETING

State Medical Association

Huron, S. D., March 20, 1936

The following officers were present: Drs. A. S. Rider, J. L. Stewart, E. Pittenger, J. F. D. Cook, W. A. Bates, H. R. Kenaston, M. J. Hammond, C. E. Sherwood, B. M. Hart, J. C. Shirley, N. J. Nessa, N. K. Hopkins, B. A. Dyar, W. F. Bushnell, Elk Point, chairman of Medical Economics Committee, secretary of quorum present.

Secretary read communication from Bureau of Legal Medicine of American Medical Association, regarding pending legislation relative to Reserve Officers Training Corps.

Dr. B. A. Dyar, Pierre, advised the Council that he had been appointed acting director of Medical Licensure for the State Board of Medical Examiners. Dr. Dyar presented matter relative to reciprocity coming before the State Board of Medical Examiners.

Moved by Dr. E. A. Pittenger, of Aberdeen, seconded by Dr. B. M. Hart, Onida, that President A. S. Rider appoint a committee of three as an advisory committee to the Board of Medical Examiners. On vote this motion carried. Dr. Rider appointed the following as a committee: Drs. S. M. Hohf, Yankton; S. F. Howe, Deadwood; J. D. Whiteside, Aberdeen.

Discussion was relative to proposed legislative program to be considered by the Council and Allied Legislative Committee for consideration at the annual meeting in May at Sioux Falls.

Motion made by Dr. N. K. Hopkins, seconded by Dr. N. J. Nessa, Sioux Falls, that the Sub-committee on Legislation, consisting of Drs. Kraushaar, Bates and Jenkins send out a news letter through Dr. Dyar, asking all members of the State Association to send in any suggestions to the above committee relative to proposed legislation, and that these suggestions come in soon. Motion carried.

Motion made by Dr. Bates, seconded by Dr. Hopkins, that each member of the Council write to Dr. Kraushaar, chairman of the Sub-legislative Committee, their recommendations for legislation for the coming year. Motion carried.

Dr. B. A. Dyar presented the Social Security law as it applies to the public health in South Dakota. After full discussion of this subject, Dr. E. A. Pittenger moved that the Council approve and commend the action of the State Board of Health, as outlined by Dr. Dyar in carrying out the provisions of the Social Security Act. Seconded by Dr. B. M. Hart. Motion carried.

Meeting adjourned.

J. F. D. Cook, M.D.
Secretary-Treasurer.

HURON, S. D., DECEMBER 3, 1935

Marvin Hughitt Hotel

Minutes of a meeting of the Councilors of the South Dakota State Medical Association.

Meeting was called to order by Dr. H. R. Kenaston; Secretary Cook called the roll, and the following members were present: Drs. A. S. Rider, E. A. Pittenger, J. F. D. Cook, W. A. Bates, M. J. Hammond, C. E.

Sherwood, B. M. Hart, J. C. Shirley, B. A. Bobb, S. M. Hohf, J. F. Kraushaar, B. A. Dyar.

Secretary Cook read the minutes of the last meeting, which were approved. Resolutions, Aberdeen District Medical Society, 1-11-111 approved.

The following resolution was proposed and passed at the regular meeting of the Aberdeen District Medical Society, in session at the Alonzo Ward Hotel, on the evening of Tuesday, November 19, 1935:

BE IT RESOLVED, That it is the sense of this meeting that the State Council be instructed to take whatever action it deems advisable to make Sanator a sanitarium for the care of curable cases of tuberculosis, the evident purpose, and only purpose for which Sanator was founded.

Respectfully submitted,

J. O. F. Kraushaar, M.D., Chairman,
W. A. Bates, M.D.,
J. D. Whiteside, M.D.,
Committee on Resolutions.

The following resolution was proposed and passed at the regular meeting of the Aberdeen District Medical Society, in session at the Alonzo Ward Hotel, on the evening of Tuesday, November 19, 1935:

BE IT RESOLVED, That the Council of the State of South Dakota Medical Society be aided and abetted in any efforts it may put forth to procure for South Dakota a sanitarium for the care of advanced cases of tuberculosis.

J. O. F. Kraushaar, M.D., Chairman,
W. A. Bates, M.D.,
J. D. Whiteside, M.D.,
Committee on Resolutions.

111. This society further recommends that whatever the Council decides, do it as quickly as possible in the hope that if a new sanitarium is contemplated, it could be built with Federal aid.

Dr. Pittenger moved that a committee of three be appointed to present whatever legislative bills the Council felt should be presented. Motion seconded and carried.

The president appointed the following committee: Drs. J. O. F. Kraushaar, P. B. Jenkins and W. A. Bates.

Moved by Dr. B. A. Bobb and seconded by Dr. C. E. Sherwood that The Journal-Lancet be held to one dollar per year, as per action of House of Delegates, May 13, 1935. Carried.

Secretary read letters of resolutions from various state medical associations.

Report of Dr. A. S. Rider regarding State Sanitarium at Sanator duly adopted.

Special Report of Dr. A. S. Rider on the State Sanitarium at Sanator

I have just returned from a visit to Sanator, the South Dakota hospital for the treatment of tuberculosis. My purpose was to obtain first-hand information concerning the problems of that institution.

Sanator was established in 1911. It is beautifully situated in the Black Hills near Custer. Its capacity is 192 beds, and there are now 183 patients. My visit gave me a favorable impression of the efficiency, energy and interest of the staff. The rooms were clean and orderly. The meals were excellent and the morale of the patients all that one could expect. Those that I saw were cheerful and hopeful. The original purpose of Sanator can be best stated by quoting from the statutes regulating admission:

"No patient shall be admitted to the sanitarium except those afflicted with pulmonary tuberculosis in the incipient state, and who show reasonability of satisfactory improvement by treatment therein."

How far the institution has wandered from the original purpose will be plain from the following report: Fifty per cent of the patients are classified as moderately advanced, 40 per cent far advanced, 10 per cent incipient. Experience has shown that half of the incipient cases prove to be non-tuberculous. In fact, therefore, only five per cent of the patients fall within the provisions of the statute.

Sanator contains now 69 patients who have been there for less than six months; 27 patients for six months to one year; 21 patients for one to two years; 20 patients for two to three years; four patients three to four years; three patients for four to five years; seven patients for five to six years; 13 patients for more than six years, and two patients more than 11 years. There are 21 school teachers, 19 females and two males. During the past month there have been 16 admissions and their classification gives the same proportions. I saw films of three cases admitted during the week that represented far advanced and hopeless tuberculosis.

It seems to me that these unfortunate conditions have been brought about by the use of the term "incipient." While it is true of tuberculosis as well as other diseases, that early recognition is of great assistance in treatment, it is equally true that incipient tuberculosis may be and often is hopeless, while advanced tuberculosis may be and often is, by proper treatment, amenable to arrest and symptomatic cure.

Admission to Sanator is obtained through a board composed of county judge, states attorney and a local medical examiner. The examiner or superintendent of Sanator has power to reject upon application but if he admits a patient, that patient can be removed from Sanator only by cure, his own wish, because of a major violation of the rules or by death. Local boards have been and are unwilling to close the door of hope against applicants for treatment and have, therefore, in the original application, listed cases as incipient that were, in fact, advanced. Such cases have been accepted at the institution for similar reasons.

The treatment of tuberculosis has made great progress since 1911. At that time, bed rest, fresh air and proper food were deemed the essentials of treatment. The doctor's position was a rather passive one. He watched the progress of his patients guided by temperature, weight and a speculative stethoscope. Now, with modern X-ray technique the changes in the lung can be visualized and a blueprint made of the treatment. The physician's role is an active one. Collapse therapy, nerve operations, thoracoplasty and pleural excisions have made possible an active and effective attack upon the disease. One can see the improvement as it develops as one watches a house grow in the hands of the builder.

It will be argued that it is desirable to care for the advanced and hopeless cases for the purpose of protecting the families and home communities from infection. There can be no question that such measures are highly desirable. That, however, is not the purpose for which Sanator was designed. Its entire facilities are hopelessly inadequate for any segregation. It is conservative to estimate that there are 10 open active cases for every annual death. That means that South Dakota, with her 250 deaths per annum, has at all times 2,500 open active cases of tuberculosis scattered throughout the state. It is plain that Sanator as a means of segregating sources of tubercular infection would be nothing more than a futile gesture, were its entire capacity devoted to that purpose. The mission of Sanator is the treatment of hopeful tuberculosis. Every bed occupied by hopeless cases, or cases that could be cared for at home, means that a like number of hopeful cases will be unable to obtain treatment.

The problem of handling advanced tuberculosis is important and pressing but it has nothing to do with Sanator and does not belong to this discussion. The statute provides that Sanator does not belong to this and is for incipient tuberculosis. The records of the institution show that 90 per cent of its patients are advanced and five per cent non-tuberculous.

A taxpayer's suit might be instituted that might restrain county commissioners from paying the patients that were not incipient. The records of the institution would provide the evidence.

It seems to me that Sanator should be re-dedicated to its former mission, that is, the treatment of hopeful tuberculosis:

First, that the statutes should be changed and the words "in the incipient state and" deleted. It would then read "no patient shall be admitted to the Sanitarium except those afflicted with pulmonary tuberculosis who show reasonable probability of satisfactory improvement by treatment therein." This, I believe, would correctly interpret the purpose of its founders.

Second, that staff of the institution be allowed to admit patients for a trial period in order to determine whether or not they are amenable to treatment.

Third, cases not amenable to treatment and cases that can be cared for at home (such as collapse cases needing only refills) should be dismissed from the sanitarium that beds may be had for the treatment of patients that are amenable for treatment.

Fourth, that there be a time limit of six months with the requirement of that further treatment and care would depend upon the recommendation of the superintendent, with a detailed statement of the benefits obtained and the prospect for further improvement.

Fifth, that these proposed changes be not retroactive: that is, that they apply only to admissions subsequent to the changes in the statute covering admissions.

Motion was made by Dr. Dyar to petition the Public Health Committee of the State Planning Board to make an investigation of the State Sanitarium and ask for a recommendation from the State Planning Board to the council of the State Medical Association. Motion was seconded and carried.

Dr. Cook moved that the report and plan of Post-graduate Lectures and Demonstrations of Dr. Ohlmacher be approved. Motion carried.

Dr. Rider moved that 100 copies of the debate, "Socialized Medicine," be purchased and distributed over the state of South Dakota.

Dr. Ohlmacher addressed the Council regarding two-year medical schools and a committee consisting of Drs. Kraushaar, Pittenger and Bates was appointed to formulate resolutions to send to the Council of the American Medical Association on Hospitals and Medical Education. Carried.

Report of the Committee on the School of Medicine, Appointed by the President of the State Medical Association

At a meeting of the Council of the South Dakota State Medical Association, held at Huron, December 3, 1935, there was a full discussion of the recent action taken by the Council on Medical Education and Hospitals of the A. M. A. in reference to two-year medical schools.

It was the unanimous opinion of the Council that a record of its sentiments regarding the School of Medicine of the University of South Dakota and the adoption of a resolution to be submitted to the Council on Medical Education and Hospitals be considered.

The South Dakota State Medical Association has noted with sympathetic interest the development and accomplishments of the School of Medicine of the University of South Dakota.

This Association is fully aware of the high type of medical instruction given to the matriculates of this school.

Sixty-five per cent of its students are enrolled from the state of South Dakota; over thirteen per cent of its graduates are sons of physicians living in this state; and over nine per cent of the registered physicians of South Dakota are graduates of this school.

A high percentage of its graduates have achieved distinction in medical research, clinical teaching and practice. These facts and many others of similar significance convinced the council that to close this school would be a serious blow to medical interests of South Dakota.

On the basis of the above and similar considerations, the following resolution was unanimously adopted:

BE IT RESOLVED, That the Council of the South Dakota State Medical Association respectfully petition the Council on Medical Education and Hospitals of the A. M. A. to rescind its action concerning the two-year medical schools.

Dr. J. C. Ohlmacher gave the following report and plan of:

Post-graduate Lectures and Demonstrations

I. Diseases of the Kidney (nephritis and allied diseases).
  A. A consideration of the anatomy of the functional unit.
  B. Mechanism of the functional unit with explanation of how each portion of the unit functions and a consideration of various factors involved in the process.
  C. Simple classification of nephritis and allied diseases with a consideration of pathology; significant symptoms with explanation of factors which produce these symptoms. (This includes consideration of Kidney of hypertension.)
  D. Functional tests including test meal, water test and diet test with recognition and interpretation of results.
  E. Blood chemistry.
  F. Rational therapeutic management.
  Note 3 lectures, illustrated by lantern slides, gross and microscopic specimens. J. C. Ohlmacher and Edwin Shaw.

II. A. Diseases of the Cardiovascular System.
    1. Brief survey of factors which determine a normal circulation.
    2. Classification of endocarditis.
    3. Etiology of endocarditis.
    4. Gross and microscopic pathology illustrated by lantern slides, gross and microscopic specimens.
    5. Significant diagnostic criteria of certain forms of endocarditis.
    6. Dynamics of chronic valvular lesions.
  B. Arteriovascular Diseases.
    1. Syphilis of arteries (aortitis, arteritis).
    2. Rheumatic disease of the arteries.
    3. Thromboangiitis obliterans.
    4. Arteriosclerosis (simple, senile).
    5. Diffuse, hyperplastic sclerosis with consideration of essential hypertension.

Note: This discussion of etiologic factors, significant diagnostic criteria, gross and microscopic pathology will be illustrated by lantern slides, gross and microscopic specimens. J. C. Ohlmacher. (A consideration of the drug therapy may be included in which case Dr. H. V. Atkinson, Professor of Pharmacology, will assist.)

III. Cancer—Two Lectures by J. C. Ohlmacher, M.D.

- A. Etiology.
- B. General pathology.
- C. Cancer of skin.
- D. Cancer of the stomach and intestines.
- E. Cancer of breast.
- F. Cancer of uterus.
- G. Method of diagnosis and early diagnostic criteria.

Note: Gross and microscopic pathology will be illustrated by lantern slides and gross and microscopic specimens. Emphasis will be placed on the early recognition of potential and pre-cancerous lesions as a means of prevention.

IV. Courses of Lectures by H. V. Atkinson, Professor of Physiology and Pharmacology.

- A. Recent advances in the knowledge of vitamins, with special consideration of the anti-sterility vitamin E.
- B. Present state of our knowledge of adrenal glands.
- C. Color-blindness.
- D. Basal metabolism.
- E. Recent advances in the physiology and pharmacology of the sex glands.
- F. The new pharmacopoeia.

Note: One of several of these subjects may be given depending on the time allotted.

V. Course of Lectures by Edwin H. Shaw, Professor of Biochemistry.

Course 1:

- A. The use of blood chemistry in diagnosis.
- B. Indications for various analyses.
- C. Interpretation of results of various analyses (analytical tests covered will be non-protein nitrogen, urea nitrogen, creatinin, uric acid, glucose, cholesterol, calcium).

Note: Consideration of the importance of blood chemistry and its relation to nephritis and allied conditions might well form a part of the course on kidney diseases given by Dr. Ohlmacher.

Course 2—Acid-base Balance:

- A. The normal mechanism for the regulation of the acid-base balance.
- B. Classification of the various tests of acidosis and alkalies showing the aberration from the normal mechanism.
- C. The chemical basis of the recognition of the acidosis and alkalosis conditions as exemplified by the various tests in common use:
  1. Alveolar carbon dioxide, fredericia and Marriot methods.
  2. PH in blood.
  3. Acid excretion.
  4. Alkali tolerance.
  5. Carbon dioxide combining power and content of plasma in which is given a brief description of the test and its relation to the mechanism for the control of the acid-base balance, and pointing out indications for, fallacies of, errors involved in, and contraindications to the test.
  6. Usefulness of the test in early diagnosis, management and prognosis in conditions of disturbed acid-base balance tests.

Course 3—Clinical Laboratory Tests for Kidney Function—A Critical comparison of the Tests in Current Use From Point of View of:

- A. The normal function of the kidney.
- B. The functional aberration in various types of renal disease.
- C. Brief description of the test with its relation to kidney function.
- D. Indications for, fallacies of and errors involved in the test.
- E. Usefulness of the test in early diagnosis, management and prognosis of conditions of the kidney.
- F. Examples for interpretation. Tests to be considered: Urinary, albumin, water test, concentration test, Mosenthal test, blood urea, blood creatinin, dye test, urea excretion (McLean), urea clearance and alkali reserve.

Course 4—Recognition of Diabetes Mellitis by Laboratory Methods:

- A. Normal carbohydrate metabolism.
- B. Carbohydrate metabolism in diabetics.
- C. Laboratory tests for Diabetes Mellitis: Glycosuria, Ketonuria, hyperglycemia, glucose tolerance, daily glucose metabolism capacity, acidosis, respiratory quotient, with a brief description of the test and its relation to diabetes and other diseases in which carbohydrate metabolism is disturbed, pointing out indications for, fallacies of and errors involved in the test.
- D. Usefulness of the test in early diagnosis, management and prognosis of diabetes.
- E. Examples for interpretation.

Course 5—By C. A. Hunter, Professor of Bacteriology and Hygiene.

Lecture II—Newer Knowledge in Bacteriology and Immunity of the following diseases:

- A. Diphtheria.
- B. Streptococcus infections.
- C. Enteric diseases.
- D. Tuberculosis.
- E. Pneumonia.
- F. Whooping cough.
- G. Undulant fever.

Note: One or several of these may be considered in one lecture, emphasis being given to specific treatment, specific diagnosis with demonstrations and technic of such tests as the Schick and Mantoux.

Lecture II—Discussion of water and milk and their relation to public health. In this discussion the various laboratory tests of practical value will be explained and illustrated. Interpretation of results, errors involved, and so forth, will be considered.

Lecture III—Discussion of Immunity, Anaphylaxis, Allergy, etc.

Lecture IV—Methods of Collection and Sending in of specimens to the Laboratory for Bacteriological Diagnosis.

Note: If there are any particular subjects or phases of bacteriology which the physicians would like to have discussed the necessary arrangements can be made.

Dr. Ohlmacher is the only one connected with the School of Medicine who can get away at any time. When courses by the other members of the faculty are contemplated, arrangements must be made so that these courses will come at appropriate times during school holidays and during the summer.

Holidays are as follows:

November 27 to December 2—Thanksgiving vacation.
December 20 to January 6—Christmas vacation.
February 22—Washington's birthday.
April 1 to 7—Spring vacation.

Any time during the summer after June 8 and before the middle of September when school opens.

Arrangements for giving any or all of these courses at the University proper can be perfected. Naturally, they can best be given during the holidays or summer months. Courses extending throughout a week or more, including instruction in subjects of interest to the profession may be arranged. Thus courses on the various problems with which the State Health Laboratory is concerned in the application of these problems to the public health could be developed, also courses on laboratory technic with interpretation of laboratory findings, including the simple tests and some of the more complicated tests.

J. C. Ohlmacher, M.D.

Approved by Council, Dec. 3, 1935,
J. F. D. Cook, Secretary.
Signed:
J. O. F. Kraushaar, M.D., Chairman,
E. A. Pittenger, M.D.,
B. A. Bates, M.D.

Motion made to adjourn—carried.

COUNCIL MEETING

Huron, S. D., September 3, 1935

Meeting of the Council called to order by President Dr. A. S. Rider.

Members present: Drs. A. S. Rider, C. E. Sherwood, W. G. Magee, W. A. Bates, B. A. Bobb, M. J. Hammond, S. M. Hohf, N. J. Nessa, J. C. Shirley, H. R. Kenaston, J. C. Ohlmacher, E. A. Pittenger, N. K. Hopkins, B. A. Dyar and J. F. D. Cook.

Motion by W. A. Bates, duly seconded, that the amount due on the executive secretary's salary for June, July and August be paid by the secretary-treasurer. Carried.

Motion by W. G. Magee, duly seconded, that an assessment of $2.00 be levied on the membership as published in the July 15th issue of The Journal-Lancet. This assessment was levied by the House of Delegates at the May 15th, 1935, meeting at Pierre. Motion carried.

Dr. J. C. Ohlmacher gave a talk on "Medical Education and Post-graduate Work."

Motion by S. M. Hohf that we have a line in the printed program stating that all the members are invited at any time to attend any meeting of the Council and House of Delegates. Motion duly seconded and carried.

Motion by C. E. Sherwood, seconded by W. G. Magee, that the executive secretary be requested to furnish the councilor of each district the addresses of all the physicians in the state. With the request that the councilor return the list with names deleted that would not be acceptable to their district medical society. Carried.

Motion by W. A. Bates, seconded by C. E. Sherwood, that it is the sense of the Council that the president of the Association write personal letters to those physicians found eligible, inviting them to membership in the Association, and that the executive secretary be requested to make personal visits as far as his duties will permit. That the district societies appoint special membership committees to conduct a personal membership campaign. Motion carried.

Motion by Dr. W. A. Bates that we express our interest in a post-graduate educational program as presented by Dr. J. C. Ohlmacher, and request Dr. Ohlmacher to prepare a tentative program. Seconded by Dr. B. A. Bobb and carried.

Motion by Dr. W. G. Magee, seconded by Dr. W. A. Bates, that we express our interest in the work of the Economics Committee, that we are anxious to co-operate in every way for the best interest of the Association, and request them to prepare for us a concrete proposal. That we will meet with them as soon as they are ready to present the same to the Council. Carried.

Dr. C. E. Sherwood made the motion that the Council go on record as approving of the State Board of Health's anti-tuberculosis campaign program, particularly in regard to the testing of our school teachers. Seconded by W. A. Bates and carried.

Motion by Dr. E. A. Pittenger that we approve the Mantoux examination as outlined by the State Board of Health and suggest that appropriate steps be taken by the State Board of Health to inform the county school superintendents in respect to a proper and approved technique. Motion duly seconded and carried.

Dr. N. K. Hopkins, president, and B. A. Dyar, secretary of the Allied Council, gave a report of the meeting of the Allied Council.

It is the request of the Allied Council that each of the legislative committees of their respective associations present in writing all bills that they wish presented before the next session of the legislature and that these bills be in our hands at the medical meeting next May to be co-ordinated, or before that time if possible.

It is almost imperative that the secretaries of the different organizations have their programs arranged so that we can have one day for all the organizations to meet together. As to the public, please be very careful what you tell the public as to the purpose of this organization. The Allied Council ask that they be allowed $25.00 from the Association to be used for postage and other expenses.

We think that this is the best step that has been taken by the medical profession in 25 years.

Motion by Dr. W. G. Magee, seconded by Dr. C. E. Sherwood, that the Allied Council be allowed $25.00 for expenses. Carried.

The Allied Council ask that the Legislative Committee draw up a law that will take care of the indigent sick of South Dakota, and if we don't we must accept what Washington gives us. Dr. Bates suggested a committee of three that can get together and have something to report.

The date set by the Council for the annual meeting in Sioux Falls was May 4, 5, 6, 1936.

It was informally agreed upon that on Monday, May 4, 10:00 a. m., first meeting of the Council; 1:00 p. m., first meeting of the House of Delegates; 7:00 p. m., second meeting of the House of Delegates.

Tuesday forenoon to be devoted to fracture clinics. Tuesday afternoon will be the general meeting under the economics committee and allied groups. Dinner, Tuesday evening, to be arranged for all groups.

Wednesday, a scientific meeting.

Motion to adjourn.

Respectfully submitted,
J. F. D. Cook, M.D.,
Secretary-Treasurer.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION IN FIFTY-FIFTH SESSION

Sioux Falls, South Dakota

First Session of House of Delegates

Monday, May 4, 1936, 7:00 P. M.

New City Hall

Meeting called to order by Dr. A. S. Rider, president.

Roll call by the secretary with the following Council members present:

Drs. A. S. Rider, J. L. Stewart, E. A. Pittenger, J. F. D. Cook, J. R. Westaby, B. A. Dyar, W. A. Bates, M. J. Hammond, C. E. Sherwood, B. M Hart, J. C. Shirley, B. A. Bobb, N. J. Nessa, S. M. Hohf, H. R. Kenaston, N. K. Hopkins, Chas. Flett, and W. G. Magee.

Delegates as follows: Aberdeen District, J. D. Whiteside and J. O. F. Kraushaar; Watertown District, J. B. Vaughn; Madison District, Harold Miller; Pierre District, H. B. Martin; Huron District, E. W. Feige; Mitchell District, W. J. Maytum; Sioux Falls District, M. A. Stern; Yankton District, E. M. Stansbury; Black Hills District, R. E. Jernstrum; Rosebud District, E. C. Smith; Kingsbury District, E. H. Grove; Whetstone District, Faris Pfister.

Secretary announced a quorum present.

Secretary Cook presented the minutes of the 1935 session as published in the July 15th and October 1st, 1935, issue of The Journal-Lancet. Dr. Sherwood moved that the minutes as published be adopted. Motion seconded and carried.

Report of officers by Dr. Cook.

Appointing of Reference Committees by Dr. Rider.

Auditing Committee: Drs. Sherwood, Hart, Shirley.

Resolutions and Memorials: Drs. Dyar, Sherwood, Magee.

Constitution and By-Laws: Drs. Vaughn, Hopkins, Hart.

Nomination and Meeting Place: Drs. Kraushaar, Vaughn, Miller, Maytum, Stern, Stansbury, Feige, Jernstrom, Smith, Grove, Pfister, Martin.

Financial Report
of
Secretary-Treasurer Dr. J. F. D. Cook
May 14, 1935

Cash on hand in bank		$1,064.75
Dues for 1935		115.00
Special Assessment		496.00
1935—		
October 19—Black Hills	$ 90.00	
October 21—Huron	38.00	
November 9—Watertown	48.00	
November 9—Madison	26.00	
November 22—Aberdeen	92.00	
March 3—Sioux Falls	90.00	
March 11—Yankton	56.00	
March 25—Kingsbury	16.00	
April 18—Rosebud	16.00	
April 30—Whetstone Valley	24.00	
	$496.00	
Dues, 1936		$1,380.00
Total		$3,055.75
Disbursements—		
Vouchers No. 309 to 463, inclusive		$2,262.56
Exchange		2.45
		$2,265.01
Cash Bank balance		790.74
Total		$3,055.75
May 2, 1936—		
Balance forwarded		$ 790.74
Trust Certificate No. 375	$ 735.92	
	500.00	
	$1,235.92	

J. F. D. Cook, M.D.,
Secretary-Treasurer.

Report of Membership by Districts

District	Membership, 1936
1—Aberdeen	40
2—Watertown	23
3—Madison	15
4—Pierre	15
5—Huron	18
6—Mitchell	28
7—Sioux Falls	54
8—Yankton	39
9—Black Hills	27
10—Rosebud	9
11—Kingsbury	8
12—Whetstone Valley	12
	288

Report of Standing Committees

Report of the Committee on Medical Education and Hospitals was given by Dr. Ohlmacher. Called attention to outline as presented to Council, December 3rd, 1935.

Report of Medical Economics Committee by Dr. Bushnell. Dr. Bates moved to accept this report and refer it to the Reference Committee, on report of councilors and officers. Motion seconded and passed.

Report of the Necrology Committee read by Dr. Cook in absence of Dr. W. H. Saxton. Moved by Dr. Smith and seconded by Dr. Westaby to accept report and refer it to the Reference Committee on report of councilors and officers.

Report of Committee on Public Health was read by Dr. Sherwood in absence of Dr. I. M. Freshour. Dr. Sherwood moved this report be accepted and referred to the Reference Committee on report of councilors and officers. Seconded by Dr. Bates and passed.

Report of Radio Broadcasting Committee by Dr. S. M. Hohf. Dr. Hohf moved to accept report and refer to the Reference Committee on report of councilors and officers. Seconded by Dr. Stansbury. Passed.

Report of Committee on Military Affairs read by Dr. Cook in absence of Dr. H. T. Kenney. Dr. Westaby moved and Dr. Stansbury seconded that the report be accepted and referred to the Reference Committee on report of councilors and officers. Report of the Allied Council by Dr. Hopkins. Dr. Hopkins moved that the report be accepted. Seconded by Dr. Westaby and passed. Dr. Hopkins brought up the matter of a combined meeting for next year. After much discussion it was decided that it would be best not to have a combined meeting for the coming year, but at the 1937 meeting decide upon the feasibility of a combined meeting for the legislative year in co-operation with the Allied organizations.

Dr. Cook read a resolution from the Sioux Falls Medical Society concerning the endorsement of a candidate for president of A. M. A.

Kansas City meeting referred to the Committee on Resolutions.

Report of I. D. Weeks, president of South Dakota University read by Dr. Cook concerning Spafford Memorial Scholarship:

Dr. J. F. D. Cook, Secretary-Treasurer,
South Dakota State Medical Association,
Langford, South Dakota.

Dear Dr. Cook:

I am listing below the awards of scholarship under the Spafford Memorial Scholarship from 1929 to the present year.

1929—Maurice Waara, Buffalo, S. D.
1930—Dorothy Cole, Madison, S. D.
1931—Agnes Schmit, Castlewood, S. D.

1932—Ervie Lovejoy, Vermilion, S. D.
1933—Ruth Waggoner, Philip, S. D.
1934—Marian Schmit, Castlewood, S. D.
1935—Not awarded.

Trusting this answers your inquiry, I am,

Sincerely yours,

I. D. WEEKS,
President.

The honorary membership list was read by Dr. Cook. The following names were submitted:

Drs. Perkins, Craig, Roberts, Posthuma, Sioux Falls.
Dr. F. W. Freyberg, Aberdeen.
Dr. E. C. Miller, Brookings.
Dr. Cruickshank, Vermilion.
Dr. J. L. Foxton, Manchester.
Drs. H. A. Tarbell, E. J. Paulson, Watertown
Dr. W. S. Bentley, Sioux Falls.
Dr. E. E. Torwick, Volga.

Dr. Bates moved this list be accepted as honorary members to the society.

Motion seconded by Dr. Westaby and passed.

Dr. Sherwood moved that Dean Serles, State School of Pharmacy, Brookings; Drs. Atkinson, Shaw, McFall and Hunter, of the State University, be elected as associate members of the State Medical Society. Seconded by Dr. Pittenger and passed.

The matter of THE JOURNAL-LANCET was brought up for discussion.

Minutes of 1934 read by Dr. Cook.

Special announcements were made by Dr. W. A. Donahoe.

Dr. Westaby, 1935 delegate to the A. M. A., read his report of the meeting.

Dr. Westaby moved adoption of the report. Seconded by Dr. Bates. Passed.

Dr. Westaby also moved that the Society send Dr. Tate Mason, president-elect of the A. M. A., a resolution of sympathy. Seconded by Dr. Hart and referred to Committee on Resolutions.

It was decided that the Nominating Committee meet at the Cataract, Tuesday at 1:00 p. m.

Meeting adjourned.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION IN FIFTY-FIFTH SESSION

Sioux Falls, South Dakota

First Council Meeting

Tuesday, May 5, 1936, 12:00 Noon

New City Hall

Meeting called to order by Dr. Rider, president. Roll call. Quorum present.

Dr. Jones, of Mitchell, spoke on the cattle testing program for tuberculosis in South Dakota. A general discussion on this subject followed.

Dr. Flett moved that the president of the Council get in touch with Dr. Riggs in Pierre and have him interview an attorney to act as a friend of the Supreme Court and present properly to the Supreme Court the testing of cattle for tuberculosis as a public health need. The motion was seconded and passed.

Dr. J. A. Myers, of Minneapolis, representing THE JOURNAL-LANCET. Dr. Myers agreed to contact THE JOURNAL-LANCET Committee in Minneapolis about the subscription price of THE JOURNAL-LANCET. It was agreed to report to the House of Delegates that the sum due THE JOURNAL-LANCET should be paid at the rate of $1.50 per year.

Dr. Sherwood moved that the Council continue the office of executive secretary and approve the funds as last year, that a special assessment of $3.00 be made to cover salary of executive secretary. Dr. Hohf seconded the motion. Motion passed.

Meeting adjourned.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION IN FIFTY-FIFTH SESSION

Sioux Falls, South Dakota

Second Meeting of the House of Delegates

Tuesday, May 5th, 7:00 P. M.

New City Hall

Meeting called to order by the president, A. S. Rider.

Roll call by the secretary, Dr. J. F. D. Cook, with the following present: Drs. A. S. Rider, J. L. Stewart, E. A. Pittenger, J. F. D. Cook, J. R. Westaby, B. A. Dyar, W. A. Bates, M. J. Hammond, B. M. Hart, J. C. Shirley, B. A. Bobb, N. J. Nessa, S. M. Hohf, N. K. Hopkins, Chas. Flett, E. G. Magee, councilors. Delegates present: J. D. Whiteside, J. F. Kraushaar, J. B. Vaughn, H. B. Martin, W. H. Griffith, Wm. F. Bushnell, R. E. Jernstrom, E. C. Smith, C. A. Feige, Faris Pfister.

Secretary announced a quorum present.

Dr. W. S. Bentley, of Sioux Falls, spoke on the subject of establishing a Veteran's Hospital in the eastern part of South Dakota and wished that our Congressmen would attempt to secure such for the state.

Dr. Kraushaar moved that this matter be referred to the Committee on Public Policy and Legislation. Dr. Pittenger seconded the motion. Passed.

Reports of the committees: Dr. B. A. Dyar reported for the Committee on Resolutions. He moved that Dr. Westaby's report of the A. M. A. meeting (1) be accepted without change; that the committee endorse the report on the candidacy of Dr. Apt and refer same to J. R. Westaby, delegate to A. M. A.; that the report of Inter-Allied Council (2) be accepted and endorsed without change; that the report on Military Affairs (3) be accepted and endorsed without change; that the report of the Broadcasting Committee (4) be accepted and endorsed without change; that the report of the Economics Committee (5) be accepted with a few minor changes; that the report on the matter of Maternal and Child Welfare (6) be accepted with changes; that the report of the Memorial Committee (7) be accepted and that Dr. Sherwood be appointed to write condolence and send to families of physicians so honored who have passed away within the last year, that this be published in THE JOURNAL-LANCET and also in the minutes. Dr. Dyar made a motion to adopt this report. Dr. Hohf seconded the motion. Passed.

Dr. Cook gave the report of the membership. It was moved that the following list of physicians be given honorary membership in the society. Seconded and passed: Drs. Perkins, Bentley, Roberts, Craig, Posthuma, Sioux Falls; Drs. Paulson and Tarbell (H. A.), Watertown; Freyberg, Aberdeen; E. C. Miller, Brookings; Dr. T. Cruickshanks, Vermilion; John Foxton, Huron; H. W. Sherwood, Doland; E. E. Torwick, Volga. Associate membership: Drs. Atkinson, Shaw, McFall, Hunter, Serles. Dr. Pittenger moved that the above five doctors be given associate membership. Motion seconded and passed.

Dr. Kraushaar reported for the Committee on Nominations and Meeting Place. Dr. E. A. Pittenger and Dr. E. A. Grove were nominated by the committee for the office of president-elect. Dr. J. F. D. Cook and Dr. J. C. Shirley were nominated for vice-president. Councilors nominated were Dr. Sherwood, 3rd District; Dr. J. C. Shirley, 5th District; Dr. O. J. Mabee, 6th District; Dr. W. A. Donahoe, 7th District. Dr. A. S. Rider, delegate to the A. M. A., and Dr. Cook alternate to the A. M. A., were nominated.

Rapid City was selected for the 1937 meeting of the society.

Dr. Jernstrom said that Dr. Grove asked to withdraw his name and that a unanimous ballot be cast for Dr. Pittenger.

Dr. Shirley wished to withdraw his name and give his support to Dr. Cook.

Dr. Cook objected to his name being submitted for vice-president.

Dr. Hohf moved that Dr. Cook's objection be withdrawn and that he become a candidate. Dr. Hohf also moved that the report of the Nominating Committee be adopted. Motion seconded and passed.

Dr. Pfister said that he was in accordance with Dr. Cook's views and feels that there has been more or less cut-and-dried negotiations in the political clique. And he feels that this should be brought to the attention of the House of Delegates and wishes to go on record as a dissenting voice.

Election of officers:

President-elect: Pittenger, 21; Grove, 1.

Dr. Pfister moved that a unanimous vote be cast for Dr. Pittenger. Seconded and passed.

Vice-president: Cook, 21; Shirley, 2.

Dr. Bobb moved that the vote be made unanimous for Dr. Cook. Seconded and passed.

Dr. Hohf moved that the rules be suspended and a unanimous vote cast for the nominees for the Council of the following districts: Third District, Fifth District, Sixth District, Seventh District. Seconded and passed.

Dr. Bates tendered, as councilor, his resignation to take place at the close of this meeting and that Dr. J. D. Whiteside be elected to fill the unexpired term of two years.

Dr. Magee moved that the House of Delegates accept the resignation of Dr. Bates and that a unanimous ballot be cast for Dr. Whiteside. Seconded and passed.

Dr. Rider placed Dr. Westaby in nomination for A. M. A. delegate.

Dr. Hohf moved that Dr. Westaby be re-elected to represent our Association at the national convention for a period of two years. Seconded and passed.

Westaby, 14; Rider, 10.

Moved and seconded that the secretary be elected as alternate delegate to A. M. A.

Dr. Hart moved that the Society go to Rapid City for the next annual meeting. Dr. Pittenger seconded the motion and passed.

Dr. Bobb moved that we express to Mr. Bronson, secretary of the Rapid City Chamber of Commerce, our sincere thanks for extending this invitation to this organization. This is to be done by Dr. Cook. Motion seconded and passed.

Dr. Rider stated that The Journal-Lancet deal will work out all right after conference with Dr. Myers and believes that we will be able to continue the compromise of $1.50 each year. Dr. Kraushaar moved that the meeting adjourn. Seconded and passed.

Report as adopted follows:

Report of Dr. J. R. Westaby, Delegate to A. M. A. Annual Session, Atlantic City, N. J.

June 10th to 14th, 1935

The House of Delegates convened in the Renaissance Room of the Ambassador Hotel and was called to order at 10:10 a. m., June 10th, by Vice-speaker Dr. N. B. Van Etten, of New York.

A preliminary report of the Reference Committee on Credentials was made and a roll call made to check the delegates qualified to sit in the session.

The minutes of the Cleveland session were adopted and in the absence of Speaker Dr. F. C. Warnshuis, who was called back to California because of the death of his son, the vice-speaker read the speaker's address which was then referred to the Reference Committee on Reports of Officers. Special emphasis was made in the address that the floor of the house was open to every delegate and that every member would be recognized who desired to address the body and that an impartial and fair attitude would be reflected at all times.

Since this was a joint session of the American and Canadian Medical Associations and, in fact, the first time they had met together, special ceremonies appropriate for the occasion were held to justly welcome our neighboring physicians from Canada.

The Canadian clinicians took many of the leading roles in both presentation of papers and discussions of same, bringing out many new and practical points of interest. Scientific medicine has no national boundaries. Medicine is an order in which its disciples from every country have and are working side by side to obtain the advancement of the true science of medicine. Therefore, recognizing the universality of medicine, the greetings to our Canadian brothers as one of them expressed it is warmed in the glow of our cordial fraternal association.

Dr. Walter L. Bierring, president of the A. M. A., was then introduced by Vice-speaker Van Etten and reviewed the progress of the A. M. A. step by step since the last session was held in Atlantic City in 1904, and at which time the Council on Medical Education was established. The accomplishments of this Council in the succeeding years being largely responsible for the progress made in closing the very poor and the poor medical schools and improving the best until today the graduate is equal to the best and not excelled by any in the world.

Dr. James S. McLester, president-elect, was then given the floor and spoke optimistically of the future of the profession and concluded his remarks by saying: "We have been sailing on rough seas, no doubt there are still some bad squalls ahead, but I think the worst is over and that through the exercise of the same courage, patience, good judgment and steadfastness of purpose which has been exhibited in the past year, you will be able soon to steer this ship into calmer waters." You are to be congratulated because of your insistence on the complete professional independence of the American Physician, your courage presented in a world of unrest and uncertainty is an example of clearness of vision and stability of purpose. In opposing all outside control of medical practice, governmental or otherwise, you took an important step toward the maintenance of the present high ideals of American medicine.

The report of the secretary, Dr. Olin West, shows 99,536 members of the A. M. A., a gain of over a thousand and a half over the previous year although 1,725 deceased members were removed from the membership rolls.

The American Medical Association, with a membership of nearly 100,000 in the United States, is open to all reputable physicians, is established on truly democratic principles, and through its house of delegates and officers is maintaining and promoting the policies and principles which look to the welfare of the people, the preservation of their health and their care in sickness, the advancement of medical science and the improvement of medical care of the people of the United States.

The quality of medical service to the people of the United States today is better than that of any other country which is certain evidence that the medical profession is fulfilling its obligation and hence the

House of Delegates felt justified in reaffirming its opposition to all forms of compulsory sickness insurance, whether administered by the Federal Government, the government of the individual states, or any industry or similar body.

The House of Delegates condemns as pernicious any legislation which creates a social insurance board without specification of the character of its personnel to administer functions essentially medical in character and demanding technical knowledge not available to those without medical training.

Dr. G. E. Follansbee, chairman of the Judicial Council, presented a report of the council, opposing as inconsistent, membership in two states' societies or giving non-resident memberships in state or county societies where they do not live or practice. Memberships in the association and fellowship in the A. M. A. without membership in a component county society extends special privileges not open to other members of the state associations and the national body.

The improper broadcasting of all the misrepresentation regarding foods, drugs, etc., over the radio brought a vigorous protest to the Federal Radio Commissions in both United States and Mexico.

The question of standardizing the catgut to be used was thoroughly discussed and a committee was appointed to designate the technique and the requirements necessary to govern the manufacture of an approved catgut.

Dr. J. H. J. Upham, chairman of the Board of Trustees, called attention to the following subjects: The Board has been advised that at least two states have had under consideration the matter of the reorganization of the medical profession along lines similar to those that are being followed in a number of states for the reorganization of the legal profession, namely, by a process known as integration. Under this process the entire profession of the state would be organized into a corporation by law and every licensed practitioner in the state by reason of his status would be a member of the corporation and entitled to a vote in its management. The corporation through its management by proper officers passes on the qualifications of every person seeking a license to practice in the state, supervises their professional activities while they are licensed and disciplines them as circumstances required in case of misconduct. Expulsion from the corporation and revocation of license are synonymous, for no one can practice who is not a member of the corporation. Under this system then, the profession is organized into a guild, controls its own affairs and, therefore, becomes a professional state society. The drawbacks to such a system are quite evident for the cults would be on a par with the other members practicing the healing art and the public would have to evaluate between the members of the corporation in order to get the service required for the case at hand. After considerable discussion the matter was referred back to the committee for further study.

The commercial use of the word "doctor" was referred to the House of Delegates for discussion and was finally decided to be a matter to be settled on a basis of state laws and the rulings of the Federal Trade Commission.

The report of the Committee on Medical Economics was most complete in every detail and it is the desire of the House of Delegates that every physician read the entire report of Dr. R. G. Leland.

The misunderstanding between the American College of Surgeons regarding the Medical Practice Health Insurance and the decidedly different view of the American Medical Association was clarified by a report from the committee, headed by Dr. E. H. Carey, stating that the conference with the officers of the American College of Surgeons resulted in an amicable understanding whereby the officers of the college wished to make it clear that this was not the intention of the College, for the American College of Surgeons had no desire whatsoever to conduct or interfere in any way with medical practice, but was concerned with the standardization of hospitals.

At the Cleveland session in 1934, the House of Delegates adopted ten principles which have convinced physicians and the public alike that complete medical care for the community can be made available without state control. Over 100 medical societies are now conducting or are about to initiate medical service plans to demonstrate that American medicine need not follow the path of foreign sickness insurance schemes and practices.

At the executive session Thursday the following officers of the Association were elected:

President—Dr. J. Tate Mason, of Seattle.
Vice-president—Dr. K. M. Lynch, Charleston, S. C.
Secretary—Dr. Olin West, of Chicago.
Treasurer—Dr. Herman L. Kretschmer, of Chicago.
Speaker of the House of Delegates—Dr. N. B. Van-Etten, New York.

Kansas City was chosen for the 1936 annual session.

Inter-allied Council Committee

To the President and House of Delegates of the South Dakota State Medical Association:

Your committee appointed to meet with the committees from the various professional and hospital associations of South Dakota wish to make the following report of their activities for the present year.

In 1934, the State Pharmaceutical Association met at Brookings and invited the State Medical Association and the State Dental Association to send representatives from each association to appear on their program the morning of June 11th. The president, Dr. E. W. Jones, appointed your committeeman, Dr. N. K. Hopkins, to represent our association. During the session it was suggested that the medical, dental, pharmaceutical, nurses and hospital association should have a committee in common to secure better legislative programs, economic and social programs which the various associations might have in common.

In 1935 the State Dental Association met at Huron the same time that the medical association met at Pierre, and the request was made that in 1936 a joint meeting be held in Sioux Falls. This suggestion met with the approval not only of the medics and dents but the nurses, and hospitals and pharmics and the veterinarians all decided to join in and have a convention at Sioux Falls with one day to be held in common.

Upon instructions from the House of Delegates, the president of our Association appointed a committee of two—Drs. E. A. Pittenger and N. K. Hopkins—to represent the medical association on the joint committee consisting of two from each of the other associations.

On September 3, 1935, the following committee met at the Marvin Hughitt Hotel in Huron and organized the Inter-Allied Council:

Dr. E. R. Serles	Pharmacist
Mr. H. J. Schnaidt	Pharmacist
Dr. O. W. Ellis	Dentist
Dr. O. W. Hanson	Dentist
Mr. Geo. Campbell	Hospital
Mr. Geo. Keinholtz	Hospital
Mrs. Florence Englesby	Nurse
Miss A. B. Thompson	Nurse
Dr. W. Clark	Veterinarian
Dr. Geo. Melody	Veterinarian
Dr. E. A. Pittenger	Physician
Dr. N. K. Hopkins	Physician

The officers of the Inter-allied Council are Dr. N. K. Hopkins, president; Dr. R. W. Ellis, vice-president, and Dr. B. A. Dyar, secretary-treasurer.

The excessive cold weather and snow of the winter interfered with the organization of local districts of the Inter-allied Council but local committees have been appointed and it is hoped that the state will be well organized the coming year.

The program for the one day of the common convention was in the hands of the secretaries of the various state organizations and the meeting in May will tell whether it was a good program or not.

The great point of satisfaction in the movement toward a successful organization of this kind is the fact that no one association has tried to dominate the work for the common good and are willing to put pet hobbies aside.

We are of the opinion that all the organizations represented in the council will be more successful in their legislative program at the next session of the legislature than ever before, because numbers count with the elect at Pierre.

Signed by the Committee,
N. K. Hopkins, M.D.,
E. A. Pittenger, M.D.

Committee on Military Affairs

With Ethiopia and the Far East ablaze with war; with Europe an armed camp; the League of Nations' authority and efforts for peace a farce, it is time for the United States to pay increasing and immediate attention to the question of its national defense.

As medical men, perhaps our first duty, because of our special training and knowledge of the situation, is with reference to training medical officers against our country's need for them.

Even the most ardent pacifists must recognize the necessity for an efficient medical corps in the army of any nation. It is the medical corps that keeps out of military service those unfit therefor, and which conserves the health and lives of those who enter the service, striving to restore to lives of civic usefulness those who are disabled in military activities. The military surgeon must know the physical and mental requirements of the military service; the records to be kept and the reports to be made; camp hygiene and sanitation including the control and inspection of food and water supplies; how to serve in and direct the examination of a hospital or of an advanced dressing station, and in general how to co-operate intelligently and efficiently with the rest of the military establishment.

These things cannot be learned in a day, and require special training which the civilian physician and surgeon does not receive, as a part of his education. Such training is the result of weeks and months of special work. After hostilities have begun, such a course of training is impractical for the army is busy with hastily whipping into shape civil practitioners gathered from private practice leaving them to acquire the technique of military medicine in the hard school of experience at the cost of suffering and increased and prolonged disability and unnecessary mortality among the officers and men who come under their care. The trained men in the regular army medical corps are at such times so busy with their own suddenly and greatly enlarged duties that only with the greatest difficulty can they be spared from such duty in order to assume the role of teachers.

Obviously, the proper time and place for training of officers for military service in the medical corps whether for peace or wartime work is in the medical schools of the country, when the students are young and of an age suitable for military service. That is the most economical time for training, for physicians trained at that time of life have long years of possible service ahead of them, whereas men trained later will sooner enter on years when both fixed habits and other circumstances unfit and disincline them for military activities.

The need for trained medical officers is great. Such arrangements were made possible by the National Defense Act approved June 3, 1916, which contemplated a Reserve Officers Training Corps for medical students. A considerable number of medical schools availed themselves of the opportunity of this set for fitting their students for medical military service, and some of those students were graduated to and commissioned in the regular army. The larger part of the physicians trained for military service, however, entered the Reserve Corps, and between 1920 and 1922 approximately 4,600 medical officers entered the corps and became available for service. But, the further enrollment of medical students was forbidden by a joker in the War Department Appropriation Act for 1933, which stopped all such training. The primary origin of this provision of the Act is unknown, as is its purpose. Many of the men who were trained are no longer available for service. Some have died, others have been disabled by disease and injury, and others have assumed obligations which render their services in time of war unlikely in the first instance. It is imperative, therefore, that the training of military students for service on graduation as physicians in the military service be resumed.

There is now pending before the Congress of the United States War Department appropriation bill No. HR 11035. As constituted at the time we received the last information from the American Medical Association Bureau of Legal Medicine and Legislation there was no provision for the training of medical officers. We understand, however, that the Senate has adopted an amendment recommending the re-establishment of the medical units and the Reserve Officers Training Corps.

It seems to me that it is entirely within our province and our plain duty to recommend to our Senators and members of the House of Representatives at Washington that the Senate's amendment be given careful consideration and we introduce the following resolution recommending the re-establishment of the Reserve Officers Training Corps for physicians for military service in the army of the United States.

Harry T. Kenney, M.D.,
D. A. Gregory, M.D.,
P. V. McCarthy, M.D.,
Committee.

RESOLUTION

Resolution Introduced by Committee on Military Affairs

WHEREAS, The proper care of the soldiers of the army of the United States in time of war is dependent upon especially trained physicians and surgeons, and,

WHEREAS, The proper time for such training is while the student is in medical school, and,

WHEREAS, The present laws and pending measures do not include an appropriation for the training of medical officers in time of peace.

NOW, THEREFORE, Be it hereby resolved that this Association hereby advocate the resumption of the Reserve Officers Training Corps in medical schools for the training of physicians for service in the army of the United States in times of war as a matter of national defense.

AND BE IT FURTHER RESOLVED, That copies hereof forthwith be transmitted to each of the Senators and members of the House of Representatives from the state of South Dakota.

Harry T. Kenney, M.D.,
D. A. Gregory, M.D.,
P. V. McCarthy, M.D.,
Committee on Military Affairs.

Radio Broadcasting Committee

Your Committee on Radio Broadcasting herewith presents its second annual report.

Since the report last year, beginning June 1, 1935, up to and including May 31 this year, the various districts, representing the components of the State Association, have, through their membership, presented the following number of talks, which have been or are to be put on the air:

Aberdeen, District No. 1	5 papers
Watertown, District No. 2	3 papers
Madison, District No. 3	3 papers
Pierre, District No. 4	4 papers
Huron, District No. 5	5 papers
Mitchell, District No. 6	8 papers
Sioux Falls, District No. 7	6 papers
Yankton, District No. 8	9 papers
Black Hills, District No. 9	6 papers
Kingsbury, District No. 11	4 papers

The response during the past year to requests by our state secretary that the several districts through their secretaries provide papers to be broadcasted, has been gratifying. While it is true that in a few instances the deliveries of the papers have been delayed, causing some anxiety to your Broadcasting Committee, on the whole it has been a pleasure to note the ready compliance and interest manifested in this educational feature of the association. Your committee repeats, it feels that the work undertaken by the State Association in broadcasting medical information has been of real public interest. The letters of commendation and inquiry that have come in from various sections of the country from radio fans, indicate that the interest is increasing and that the listening public continues to be anxious for authoritative medical information.

It is again urged that papers be submitted and in the hands of the committee at least thirty days preceding their broadcast; also that it is important that papers other than those specifically designated for the month may be on hand to be used when lapses occur. Substitute papers should be immediately available. Intreruptions in the program can thus be avoided. In connection herewith we suggest that the titles of papers, dates and hour of broadcast be published, through the state secretary, in our official Journal sufficiently in advance of the broadcasting for the information of our membership. It seems that during the past year instances have arisen where members of the association have not known of the broadcast and in order that more publicity be obtained, a notice in our official publication to that effect should be desirable.

Requests have come in after broadcasting for copies of the talks. In each instance the inquirer has been referred to the secretary of the Association, to whom all papers are immediately forwarded after broadcasting, for copies. Your committee recommends that such funds be set aside as may be deemed necessary and made available for the secretary to provide copies of the talks as the public may request. This is legitimate publicity and the author of a paper is entitled to this recognition of his talk and the knowledge he manifests in the discussion of his subject. We urge that this be favorably considered.

Your committee recommends, in conclusion, that a vote of thanks by this body be extended through its secretary to the House of Gurney for a continuation of its courtesy in presenting and making available to us the facilities of Station WNAX at Yankton for these medical broadcasts.

Signed:
S. M. Hohf, M.D.,
E. W. Jones, M.D.,
E. L. Perkins, M.D.

Report of Committee on Economics

Your Economic Committee, in presenting its report to you at this session, has labored more to detect the failure, if any, in its proposals submitted at the last session, and its conclusions are, that there have been no failures, but rather, a lack of carrying through to fruition the proposals submitted.

However, your committee is well satisfied that a wonderful start has been made. The question of socialized medicine is still with us, and we cannot too emphatically impress upon organized medicine the necessity for continued effort, to consolidate all of its own membership, as well as of the Allied organizations in healing arts.

The ever-changing methods in medical practice does not alter the preservation of the intimate personal relation between the doctor and patient, and that the socialization of medicine will mean political control, and measures to circumvent this political socialization of medical practice should be ever before him.

However, bearing in mind that there are certain services that the doctor gets little pay for and sometimes none at all. Those might be socialized. The doctor is the only member of the community whose services for the care of public charges are commandeered without compensation, and without protest, in the rank and file of medical men, they have been patiently carrying the load of unpaid service. Consequently, by organization alone is the medical profession and its allied groups, going to meet the economic situation and be ready to control changes as they occur.

I might cite, for example, periodic health examinations. This is not clinical medicine in its generally accepted sense, but preventive medicine of the highest type. It is a method of estimating the remaining physical assets of the individual rather than a study and interpretation of the relation of obvious signs and symptoms to already existing disease. This distinction is fundamental and should ever be borne in mind.

Some county medical societies now provide their members with printed form letters to be signed and sent to patients, in order to acquaint them with the value of the examination, and to urge them to arrange for it. It is just as ethical for physicians to recommend the periodic health examination to their patients as it is to urge vaccinations for smallpox, protection against diphtheria, typhoid fever, etc.

Fees for the periodic health examinations should not be fixed but should be regulated to meet the ability of the patient to pay. A definite method of follow-up is essential to the success of the periodic health examination, since it serves in a measure to force the indifferent and neglectful to put into operation the advice which has been given. More attention should be paid to the psychic and mental aspects of the patient than is now the rule. The practice of preventive medicine through periodic health examinations is a powerful though silent gesture opposed to the present misguided efforts for the socialization of medicine.

Your committee desires to call attention of the officers of the State Medical Association.

1. The establishment of a state public health committee composed of its councilors, that they attempt to function more thoroughly by stimulating the organizaions of the public health committee in which each of its component districts, thereby bringing about a closer contact with all lay bodies that have to do with the welfare of the sick, such as county health officers, health units, county commissioners and welfare commissions.

2. Your committee desires to commend the executive secretary for his untiring efforts to bring about the crystalizing of the Economic Committee's efforts, and strongly urge that this office be continued, and the same amount of money be appropriated for this position by

the Medical Society. We also desire to commend both the executive and the elective secretary for their harmonious efforts in bringing about a co-ordination of the scientific as well as the economic part of the organization, and in perfect accord with each other. This is looked upon with a great deal of satisfaction by the membership.

3. News letters are unquestionably of great value and the enlightenment to the individual in things concerning the profession is such that it is difficult to estimate its potential value, and your committee recommends the continuing of these letters, and extends to each physician of our state organization an invitation to become a contributing editor.

4. Your committee desires to suggest that you keep the dues at $5.00 per year, for the next year, making such assessments that are needed, until all members that are eligible for membership are in their local societies.

5. Inter-allied Council: The principles back of this were fresh in all our minds back in the days before our ideals were shattered, and with the economic stress of the past few years, have come in for much discussion over the land, when with the other groups in 1934 the alliance was completed and organized, and South Dakota shall go down in history as the first state to accomplish this. This is without doubt the beginning of the national organization. The surest way to effect this and the best way to reap benefits from it, and at the same time build up separate state units, of which it consists, is, we believe, to have an executive secretary with an able assistant and open office, to administer all affairs for the Council and for the separate state groups as well. The cost should be borne with the help we now get from outside and budgeted amount from each group based on per capita membership.

6. Speakers Bureau: The Speakers Bureau, whereby the State Association through a committee, would list speakers on medical subjects, and make them available for civic organizations and lay meetings, we regret was not developed. We again advocate it and urge its formation.

7. Educational Program: Listing speakers available for medical societies was set up under the chairmanship of Dr. Ohlmacher, but outside of a few instances was not called upon for service. This, too, we deem as necessary and recommend development for this year.

8. State Medical Society Committees: This committee reiterates the meaning and intent of each committee assignment by the State Association. The age of meaningless annual reviews by committees is past. To better function and progress, we strongly advise that the Board of Councilors or House of Delegates in regular or special session, take no action on any matter which has not been previously referred to proper committee and referred back by them with recommendation. This insures able action on all matters and affairs affecting the Society, and especially the kind of action that must be evidenced on the important affairs that shall be affecting the profession from now on. It is urged that all standing committees or special committees, where possible, use the news letters and solicit information from the rank and file throughout the state. Your Economic Committee has found this useful and informative.

9. It is urged that the immunization campaign outlined and adopted at our last session be stimulated and continued, and that our State Public Health Committee be instrumental in bringing this about. It is also urged that the State Public Health Committee become closer associated with the county health officer, in order to make his office function more successfully.

10. A closer contact without state institutions, such as the State Hospital for Insane, Hospital for Feeble Minded, Hospital for Tuberculosis, and the Industrial School, be urged and more effort to have them identified with the State Medical Society, and that they be given space in our news letters as well, as having some contribution from each institution for the enlightenment of the membership of the Society on the progress of these institutions.

11. An important adjunct to the economic situation of our group is membership, and we urge further effort to make South Dakota as near one hundred per cent as possible. Your committee, in its meetings and deliberations, has been ever mindful of the support that you, as officers, councilors, delegates and members have given it, and it is through your patience and willingness to listen and your co-operation that has been an inspiration to this committee to continue and overcome what at times appeared to be unsurmountable obstacles, and for this we are grateful.

Wm. F. Bushnell, M.D., Chairman,
Will E. Donahoe, M.D.,
Monte A. Stern, M.D.

Report on the American Committee on Maternal Welfare

By Dr. George E. Whitson

About a year ago, Dr. Fred L. Adair, of Chicago, Illinois, the national chairman of the American Committee on Maternal Welfare, appointed me as the state chairman in South Dakota and at that time he requested that I organize a state committee to further the work of the national committee in our state. So far nothing definite has been done regarding this committee. I felt that it was a mistake to set up a committee which was independent of the state organization and after discussing this matter with Dr. Rider, the state president, we decided that it would be best to make a report to this group on the work of the American Committee on Maternal Welfare and to recommend that you appoint a committee within the state organization to represent the state and carry out the work of this organization.

The American Committee on Maternal Welfare is an outgrowth of a joint committee on maternal welfare formed many years ago through an action of the American Child Health Association. In 1934 the American Committee was incorporated and it now includes the following member organizations: American Association of Obstetricians, Gynecologist and Abdominal Surgeons, American College of Surgeons, American Gynecological Society, American Hospital Association, Section on Obstetrics and Gynecology of American Medical Association, American Public Health Association, Central Association of Obstetricians and Gynecologists, Chicago Maternity Center, Children's Bureau—Department of Labor, Maternity Center Association of New York, Pacific Coast Society of Obstetrics and Gynecology, Southern Medical Association, all of which have representatives in the central committee. Dr. Fred L. Adair, of Chicago, is the national chairman.

The official purpose of this committee, as stated in its by-laws is as follows:

"The object for which this corporation is formed is to awaken and stimulate the interest of members of the medical profession in co-operating with public and private agencies for the protection of the health of mothers and their offspring before and during pregnancy and labor, and after confinement, to the end that the conditions which menace and interfere with the health or life of the mother or infant may be improved or prevented, and disease and disorder corrected and prevented, health promoted and life saved; to teach the principles and practices of general and personal hygiene and health to parents; to improve and generalize the standards and methods of training physicians, nurses and others dealing with problems of maternity; to study and promote the study of the problems involved in achieving the foregoing objects; to publish and circulate publications of any kind and description to receive donations, and to purchase or acquire, receive, take, hold and manage such real and personal property by gift, grant, devise or bequest as may be necessary, useful or desirable for the purposes and objects of the corporation above set forth."

Since its incorporation the committee has attempted to stimulate the formation of state committees on maternal welfare and the work is now in active progress. As far as possible, these state committees have been formed within the present state medical set-up. These state committees have in turn fostered the formation of county committees.

We all realize that the morbidity and mortality in mothers and infants is altogether too high. The committee has been attempting to stimulate interest in this high mortality rate among the profession and also among the public and to further various educational facilities for the profession. It is felt that if a very intensive effort is put forth along this line that a great deal can be accomplished in lowering this high mortality rate. Optimum results cannot be accomplished in a day but will be achieved only through the long continued efforts of these medical men who are sincerely interested in improving maternity care.

It seems to me, without going further into the purposes of this committee, that this is a very worthwhile program and one which we should endorse very wholeheartedly. I would like to recommend the following:

1. That this group endorse this program and appoint the director of maternal and child Health Department of the State Board of Health as state chairman who will become a member of the national committee.

2. That each component district society be requested to appoint a representative from their own medical group and let this group of district representatives, together with the chairman form the state committee.

3. That this committee make a very intensive study of the maternal mortality rate in the states and possibly in each individual county and if it seems feasible to follow up this study by an investigation of all the maternal deaths in the state with the object in view of advancing plans for the prevention of maternal mortality.

4. That this committee co-operate with the present state plans of obstetrical clinics over the state and attempt to continue this sort of thing so as to make further obstetrical training and information available to general practitioners over the state.

Report of Committee on Necrology

While it is a necessary function, the Committee on Necrology submits their report with a great deal of regret. In giving a list of those physicians of the state who have passed on, it will be noted that it includes several whose faces have been familiar at our annual meetings for many years in the past and it can only be with regret that they will not be with us this year. It would only be fitting to pause a moment in the deliberation of this meeting in memory of those who have been with us in the past and some who have served in an official capacity. We desire to call attention to the following names:

Report of death of the following members of the South Dakota State Medical Association:

Edward Benjamin Taylor, Huron, S. D., aged 66, died on June 2, 1935, Councilor.

William Franklin Keller, Sioux Falls, S. D., aged 71, died in October, 1935.

Lottie Grace Biegler, Pierre, S. D.

The following was an honorary member of the South Dakota State Medical Association:

Willis E. Dinsmore, Claremont, S. D., aged 77, died February 14, 1936.

Those listed below were not members of this association:

Hubert Miller, Mobridge, S. D., aged 59, died July 5, 1935.

E. L. Syverson, Centerville, S. D., died April 8, 1936.

Respectfully submitted,
W. H. Saxton, M.D.,
M. J. Hammond, M.D.,
J. B. Vaughn, M.D.

Report of Committee on Public Health

Your Committee on Public Health begs permission to submit the following report for the past year.

Because the committee members are scattered at distant points throughout the state, it was impossible to assemble for regular meeting, but all available data has been contributed by the various members of the committee.

Previous to the meeting of the State Medical Association held at Pierre in May, 1935, there was considerable dissension on the part of the members of the State Association because of the lack of co-operation between the State Board of Health and the State Society. The Public Health Committee is very happy to report a most amicable relationship between these organizations at the present time.

The appointment of Dr. B. A. Dyar as executive secretary of the State Medical Association has accomplished the above result. The committee highly commends the work of Dr. Dyar and recommends that the position of executive secretary be continued.

Through the efforts of the State Board of Health and under the provisions of the Social Security Act, two full-time public health units have been established and three more are under consideration.

A course of Public Health Nursing has been established at the University of Minnesota, the personnel to be assigned to duty in South Dakota upon completion of their training.

Federal funds have been made available for child and maternal welfare, also for the carrying on of the preschool work.

The program of the Division of Sanitary Engineering, in an attempt to improve the status of water supply and sewage disposal throughout the state, is a marked step forward in public health matters.

Health conditions generally throughout the state maintain the average ratio. Scarlet fever has been quite prevalent, particularly in the southeastern part of the state.

Dr. Coslett, superintendent at Sanator, gives the following report on the tuberculosis situation in this state:

"Recently much has been done in our state to aid in the control of tuberculosis. We now have modern weapons and we are becoming more skillful in their use.

All agree that it is not possible to treat tuberculosis unless the patient has a good bed. At Sanator there are 192 beds. It is safe to say that these beds care for some eight or ten per cent of the active casesof tuberculosis in the State of South Dakota. Everyone knows that an active case of tuberculosis should have a bed as well as medical and nursing attention. As forty-seven per cent of the beds in the general hospitals of this state were idle during the year 1935, one wonders why these hospitals should not provide a ward or wards for the care of the active cases of tuberculosis in their communities.

If all the hospitals of this state were to provide a suitable place for the care of tuberculous cases, it would mean much to the medical and nursing profession, and would go a long way toward solving our tuberculosis problem."

The Public Health Committee calls attention to an article written by Dr. Rider, of Flandreau, "The Tuberculosis Facilities at Sanator," and published in the February, 1936, edition of The Journal-Lancet. Dr. Rider is chairman of the Public Policy and Legislation Committee and, undoubtedly, at the next session of the State Legislature an attempt will be made to correct the evils pointed out in the above named article.

Ina Moore-Freshour, M.D., Chairman,
C. E. Sherwood, M.D.,
D. S. Baughman, M.D.,
W. R. Ball, M.D.,
J. O. F. Kraushaar, M.D.,
P. D. Peabody, M.D.,
Finn Koren, M.D.,
F. S. Howe, M.D.,
R. B. Fleeger, M.D.,
F. Coslett, M.D.

PRESIDENTIAL ADDRESS*

by

A. S. Rider, M.D., F.A.C.S.

Flandreau, S. D.

Another year in the history of the South Dakota State Medical Association has drawn to a close. I wish to express my appreciation of the opportunity you have given me to observe, as your president, the march of events during the year.

No group in our social order faces a more uncertain future than the medical profession. What is ahead, no man knows. It is an interesting time in which to live. More discussion about medical economics has been heard the past two years than in all the previous existence of our society. Much of it has been a catalogue of complaints. Like our political friends, we have found it easier to criticize than to find adequate and constructive remedies. We long for the good old days, and dislike the changes that may be ahead.

To my mind there is danger in too much emphasis on *medical* economics. It offers the possibility of being construed as an essentially selfish program. Perhaps we should broaden the base and interest ourselves in economics without limitation. For our purpose we might consider economics under two headings. First: basic or general economics. Second: group or class; in our case, medical economics. As far as South Dakota is concerned, the basic problems as I see them are mainly two. First: the price-level and production of agricultural products. Second: the administration of public affairs. During the past three years the price of corn has varied from 15c to $1.00 a bushel, oats 6c to 70c a bushel, hogs from $2.50 to $10.50 per 100 lbs. Medical service cannot receive adequate and stable financial support from patrons whose income rests on such an insecure foundation.

The products and services of industry are not at the mercy of such variations. With the rise of the modern corporation, industry organized to stabilize prices. Senate Document 13—74th Congress—tells the story. From 1919 to 1933 the price of agricultural machinery declined 6%. Its production declined 80%. Agricultural prices during this same period declined 67% while agricultural production declined only 6%. Industry has created an *administrative* price level. Industrial prices remain relatively constant while its production varies. Agriculture has a stable production, but wide price fluctuations. Agriculture is on a price-level determined by supply and demand.

A method by which our farmers can produce abundance, lay up a surplus against crop failures and preserve an equitable and stable price level, is a basic problem in South Dakota. Our prosperity as physicians is as much at stake as that of our farmers, on its wise solution. I do not know the answer. I think, however, that our farmer friends and patrons should be made aware of our interest and concern in this basic and economic problem of our state. Our influence should be given to each and every intelligent effort at its solution.

Competent, intelligent and economical administration of public affairs is an urgent need in South Dakota and throughout the entire United States. Times of stress make the defects of our administrative machinery more apparent. The remedy lies in the development of non-political administration. Our medical, dental, pharmaceutical, nursing and hospital boards should be non-political. Efficiency of city, county and state administration would be increased by separation from politics. All full-time administrative personnel should be trained and be competent for their jobs. These positions should be life-time careers and not short-time political plums. The interest of the medical profession as well as that of our state at large will be served by securing the most competent and best-trained administrative organization that can be developed under our system. Our influence as a society and as individuals might well be given to the support of such a program.

A stable price-level for agriculture, efficient, intelligent administration of public affairs, will lessen the pressure for a public-supported medical service. The demand for state medicine will not and does not arise from the common people. Our South Dakota farmers do not want the state to provide them with medical care. They want income adequate to hire their own doctor, choose their own hospital, provide their own nurses and patronize their own druggist. State medicine represents an effort of bewildered politicians, incited by idealistic social workers, to mitigate some of the more visable and distressing results of economic and social mismanagement. It is a socialistic bone thrown to the wolves of depression in the hope of checking the growth of still more radical measures.

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*Read before the 55th Annual Session at Sioux Falls, S. D., May 5, 1936.

Good homes, proper food and adequate clothing are just as essential to health as medical service. State responsibility for providing such homes, food and clothing is as logical as supplying medical service. The question is simple. Are we ready for Socialism? If so, support of state medicine is logical. If we feel that our system of private-ownership that has carried us so far, is a good system, we should aid in correcting its deficiencies and not begin its destruction.

Medical economics in South Dakota is concerned chiefly with securing fair and just pay for medical services and proper consideration from public agencies. Physicians are indicted for many things. It is said that many of our members fail to keep up with the progress of medical science; that the trend towards specialization has made the cost of medical care so high as to place beyond the reach of all but the rich, the full benefit of modern technique. We are said to lack any effective or coherent attitude towards present day medical problems such as abortion, birth control, defective housing, low wages, hours of labor, *etc.* Our ideas are said to be almost invariably those of our class and that we fear to jeopardize our position by supporting unpopular opinions though they agree with our own convictions.

It is said that pressure for social reforms in the field of public health comes frequently from without the profession, even though doctors have gathered the facts leading to the demand for such reforms. We are accused of indifference to our long-unchanged statistics relative to maternal morbidity and mortality because of fear of its effect upon our prestige. These are a summation of charges collected and filed by Professor Laski. I shall not take the time to answer them. That has been well done by Dr. Shirley in the January 25, 1936, number of THE JOURNAL, A.M.A. With one point of the professor's I agree. The extent to which we may merit these charges is largely due to inadequate income, social insecurity and the pressure of competition. The underpaid doctor finds it difficult to provide himself with books, instruments, and time to keep pace with medical progress. Ethical standards depend upon adequate income as well as upon character and training. Supply and demand are factors in determining the earnings of doctors. Consideration of some control of the number of physicians is now on the agenda of the Committee of Standards of the American Council on Education. We have now in the United States one doctor to every 780 persons. England has one to every 1,490, Sweden one to every 2,890. At the present rate of increase there will be 211,000 doctors in the United States by 1980. The number of physicians is increasing faster than the population. There are now 156,000 physicians, 130,000 of whom are active. Present trends indicate that our population will become stationary about 1960. The net income of one-half of our doctors was less than $2,500 in 1929. Those were days of prosperity. What is their income now? What will it be in 1980?

It seems to me that a proper regulation of the quantity and quality of the output of our medical schools is in the interest of both the public and the medical profession. Underpaid and poorly-equipped doctors are not an asset to a community. Many years ago Dean Dodson of Rush Medical College said that there was need of better information about the character and ideals of candidates for admission into medical schools. The scholarship test was not effective. High ability and commercial ideals were only too frequently found in the same student. Formerly, there was a barrier to keep out undesirable candidates. I refer to the old time preceptor. Young men of that day who were thinking of studying medicine, consulted and later read with some physician of established character and reputation. The doctor usually knew the candidates from early boyhood. He encouraged the worthy, and discouraged the undesirable. He instilled in the minds of his student high ideals and ethical standards. This check on the quality and quantity of our numbers is gone. Nothing has come to take its place.

To me it seems highly desirable that our undergraduate schools assume this responsibility and use greater discretion in recommending students to our medical schools. Moreover, medical schools might well limit their students to a number in keeping with the best interests of the public and of the profession.

A notable development of modern medicine has been the increase of the specialties. No doubt this has been desirable and necessary, but it has brought its problems. First, it has increased the cost of medical service. Second, it has endangered the family physician relationship. Many people no longer have a family physician. They have a dozen doctors. It has aided the cults by the appeal of their more simple philosophy of healing.

Here again a duty would seem to lie with our schools, and perhaps with our legislature. Special and prolonged study might well be required of those who enter special fields. They might well be required to comply with special regulations in order to obtain license to practice in their chosen fields.

Attention might be called to the fact that there is a very important and highly-specialized field

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for the general practitioner. He should be trained to be a specialist in preventive medicine. A councillor for health, as it were. It is his opportunity and privilege to become health-minded, leaving to the specialist the onus of being disease-minded. He should be the respected advisor of the family in its contact with the specialist. Moreover, if he is competent and well trained, he will be able to care for 90 per cent of the cases needing medical care. A well rounded medical service requires the family physician as its key man.

Finally, in parting, I wish to thank you for the many pleasant contacts of the past year. I want to thank you for the privilege of serving you in some small way, and I want to offer you my congratulations upon the fine character and splendid gentleman you have chosen for your leader during the coming year.

PRESIDENT-ELECT ADDRESS

by

J. L. Stewart, M.D.

Nemo, S. D.

"SOCIAL SECURITY AND MEDICINE"

This paper is somewhat of an argument on both sides of a question, and for that reason, I wish to ask my hearers to withhold judgment until I have finished.

Social security is a live topic today, and as it affects the profession of medicine, it is fitting and proper that we give it a little thought and consideration at this time.

As most of you know, I am a salaried man, having worked for the Homestake Mining Company for the last seventeen years as one of its staff of physicians. Prior to that time I spent many years in private practice as a general practitioner. I have tried practice both ways, and for that reason feel competent to discuss the subject of private *vs.* salaried practice from personal experience. Much of the discussion that we hear on such subjects comes from laymen, who are highly emotional and thoroughly uninformed. I shall try, however, to dispense with these two elements in what I shall say to you.

The Homestake Mining Company began its system of medical service fifty years ago, and ever since that time it has been seeking to improve and add to it anything that seemed to be for the benefit of those in its employ. This service was not forced upon the company by any labor law, but was inaugurated long before there were laws of that sort.

Today the Homestake Mining Company employs seven full-time doctors and seven graduate nurses. The doctors' offices and the employment office are in the hospital building. When a man seeks employment he applies at the employment office. If the employment officer decides to hire him, he is conducted into the hospital department where he receives a medical examination similar to that given to a recruit entering the U. S. Army. If he passes this examination satisfactorily, he becomes an employee of the company, and at once both he and his family are entitled to a free and complete medical and surgical care, except that we do not have a dental department. The company employs from 2,000 to 2,500 men, and they, with their families, constitute from 8,000 to 10,000 patients for us to attend to.

The chief surgeon does most of the major surgery, is general manager of the hospital, does a large amount of consultation work, and sees special cases both in his office and in the homes. The dispensary physician never leaves the hospital during office hours, and is subject to call to the hospital for emergency at any time, night or day. The other doctors have their office hours, and the rest of the time act as general practitioners in private practice, visiting at the homes whenever they are called.

While the Homestake doctors are all general practitioners, it is recognized that each man is more proficient in some lines of practice than in others, and if agreeable to the patient, that line of work is turned over to him. The Homestake doctors are hard-working men, frequently seeing 200 office patients and making 75 house calls in a day.

We are often asked, "Don't patients impose upon you by coming to you, or calling you to their homes for very trivial complaints?"

The answer is, "Yes, but no more often than they do in general private practice."

The doctor in private practice is always imposed upon, more or less, by malingerers and people who never pay their blls. We do have some trouble with malingerers.

The calls for seemingly trivial complaints often re-act in our favor, because sometimes we head off a serious spell of sickness. And again, I am sure that on account of them we have fewer night calls. A patient who thinks that *maybe* he will need you during the night, usually calls before bed-time, thus saving us unpleasant night calls.

Our people are quite considerate about calling us up at night. When they do, they always apologize for having to do so. On the whole, I think that our patients are more courteous than patients in private practice. When we are leaving the house after making a call, they almost always thank us for calling, (a courtesy that patients in private practice usually do not think necessary). Another thing: the longer a family is in the Homestake employ, the more courteous it is to the medical profession. If we receive any discourtesy, it is usually from a recent employee.

I firmly believe that the employees of the Homestake Mining Company are getting better medical service than they could possibly get from a system of private practice, and it costs them nothing. The company figures, on the other hand, that their thousands of dollars spent in medical service are well spent, because they feel that on account of it they get better service from their employees and keep them more contented.

The elimination of the fee is a great thing. Neither doctor nor patient has to think of it. Often the thought of the bill to be paid results in a feeling of suspicion that the doctor is making too many calls, and sometimes he makes too few calls in self-defense. The Homestake set-up speaks for more confidence between patient and doctor.

Now I am going to make a statement that may seem a paradox. While I believe that the Homestake system of medical practice is good, I also believe that the same system under social security would not be so good; in fact, it might prove to be bad. Why do I think so? I shall try to show you. In the first place, we cannot divorce Government control from politics. Under any Government system, doctors would receive and hold their positions through political preference. This is not true of the Homestake. The company is interested in having its doctors do good work, and from a financial standpoint it cannot afford to employ a doctor unless he is moral, respectable, and capable. In politics this is not the case. Very disreputable and incapable men sometimes hold political positions. Besides it is very difficult to dislodge a political appointée. With the Homestake, it is quite different, because every complaint lodged against a Homestake doctor is investigated, and if it is well-founded the doctor is likely to be discharged. Again, the company favors the relationship of the family doctor and patient, which the regimentation of the social security plan tends to destroy.

The overhead expense of any form of government control is tremendous, while there is little or no overhead in the Homestake administration. Besides this, the malingerer is likely to lose his job with the company, while in any government set-up he could never be eliminated from the picture. The company employs a little higher type of men than the general run of laborers, and that eliminates the ones who would be such a menace to Government practice.

The Government should take charge of such matters as quarantine, immunization, *etc.*, as these have to do with police powers, and are for the protection of its citizens. Further than that, each citizen should act as an individual.

We cannot all work for the Homestake Mining Company, and it would not be wise for the Government to place us in a like service. What then of the private practitioner? In my opinion, he should remain a private practitioner. However, certain changes may be advisable.

The Committee on the Cost of Medical Care has brought out certain facts that cannot safely be ignored. For instance, it is stated that the cost of medical care is too heavy a burden to the public, and yet the doctors are not getting enough. This seems to be a bad state of affairs, and it is; but it should be stated in different words. We should say: "The cost of medical care falls too heavily on the honest ones who pay their bills and (with few exceptions) doctors do not get enough." (Understand that doctors who charge very large fees, and patients who do not pay their bills, are not considered in this statement.) This brings us back to the question: "What are we going to do about it?"

Some will say that social security will settle it. I do not think so. But the sentimental alarmist says, "This is a terrible condition. Something must be done at once. What do you propose to do? If you cannot suggest a better remedy you should accept social security."

That is a challenge that we cannot afford to ignore. It has been thrown into the teeth of many an abler man than myself, but I will answer it by saying that—I will accept social security as far as it deals with police powers, such as quarantine, immunization, *etc.*; but I will not willingly accept any part of it that in my judgment tends to destroy the high ideals of the noblest profession under the sun.

I think that we will all freely admit that those who pay their bills often pay too much, and as a rule doctors do not receive enough. We will also admit that something should be done about it, but we do not want to be stampeded into doing anything rash or foolish, simply for the sake of showing that we are willing to do something. Let us survey the situation calmly. First, let us ask ourselves: "Is the public suffering for medical care?" We can best answer that question by asking another.

"Do you know of anyone in need of medical care, and who really wants such care, who is denied it by our profession?"

Again under our present system we have made wonderful progress in the last forty years. This progress has been in the interest of the public, instead of our own financial interest. In stamping out disease, we have been trying to put ourselves out of business. In the last few years we have practically stamped out yellow fever, malaria, and typhoid fever. We have learned to immunize against diphtheria and scarlet fever, to say nothing about smallpox (which is ancient history). In the last forty years, the span of life in the U. S. has risen from thirty years to over sixty years, and we can say with pride that in South Dakota it is sixty-six years (by way of comparison, the span of life in India today is only twenty-three years). I repeat that we have accomplished these great things under the present system. We should be very slow to discard such a system.

In view of the foregoing facts, we are forced to the conclusion that we are dealing not with a question of bad service, but with a question of bad pay, and that what pay is forthcoming, comes as a hardship to certain individuals. The whole question then is a financial one, and let it be said to the credit of the medical profession, that many of the poorest paid doctors are making no complaints. We have thousands of general practitioners today who never refuse a call, and never ask a patient for money. The medical profession as a whole is not complaining. It is the man who pays the bills who is making the complaint. We should give that man some consideration. If we do not, we may be sorry.

I have only to refer to some of the ridiculous bills that pass legislative bodies to prove this.

It might be well to have a committee to meet with a committee of laymen to discuss the financial side of medicine and try to work out some plan that would be fair all around. The committee on the cost of medical care tried it. They have given us some things to think about. Personally, I have some ideas as to a plan that might work out. These ideas may be good or they may not be. Judge for yourselves.

I will say that politics must be left out of any plan to be inaugurated.

The family doctor idea must be preserved.

There must be no radical change.

The cost of medical care can be distributed by each patient or family paying so much to his doctor every month for services whether he is sick or not. (A form of private contract practice.) This would not prevent the doctor from seeing patients outside the contract, for a fee, in case that he was called, but it would give those who want to contract with the doctor a chance to do so and at the same time not interfere with a doctor practicing in the old-fashioned way. If the plan succeeded the doctor's work would gradually become all or nearly all contract; and if it did not succeed, he could continue to practice as he did before.

This would not be a radical change and if it failed, it would not injure the doctor or patient or any others who did not wish to try it.

A group of doctors could practice under the same plan.

As I said before, this plan may not be good, but it has come to me out of years of experience, both as a private practitioner and as a salaried doctor. One thing is certain we cannot afford to ignore the plea of the man who is honest; and because he is honest, is paying too much for medical service.

I have dropped my suggestions. I hope that the rest of you will drop suggestions that will help to solve the problem. The honest layman is entitled to this consideration at our hands. We should never forget that the welfare of our patient is paramount to every other consideration, and this includes both his physical and financial welfare.

DISTRICT AND COUNTY ROSTER

ABERDEEN DISTRICT MEDICAL SOCIETY—NO. 1

PRESIDENT

Calene, J. L. .... Aberdeen

SECRETARY-TREASURER

Alway, J. D. .... Aberdeen

Adams, J. F. .... Aberdeen
Ahlfs, J. J. .... Conde
Alway, J. D. .... Aberdeen
Bates, W. A. .... Aberdeen
Brinkman, W. C. .... Veblen
Bruner, J. E. .... Aberdeen
Bunker, Paul .... Aberdeen
Calene, J. L. .... Aberdeen
Cook, J. F. D. .... Langford
Cooley, F. H. .... Redfield
Creamer, F. H. .... Dupree
Eckrich, J. A. .... Aberdeen
Elward, R. L. .... Ashton
Farrell, W. D. .... Aberdeen
Gelber, M. R. .... Aberdeen
Gerdes, O. H. .... Eureka
Graff, L. W. .... Britton
Hill, Robert .... Ipswich
Jones, T. D. .... Bowdle
Keegan, Agnes M. .... Aberdeen
King, H. I. .... Aberdeen
Kraushaar, J. O. F. .... Aberdeen
Lowe, C. E. .... Mobridge
Lundquist, C. G. .... Leola
McCarthy, P. V. .... Aberdeen
Mayer, R. G. .... Aberdeen
Murdy, B. C. .... Aberdeen
Murdy, R. C. .... Aberdeen
Murphy, T. W. .... Bristol
Olson, C. L. .... McIntosh
Olson, C. O. .... Groton
Pittenger, E. A. .... Aberdeen
Potter, G. W. .... Redfield
Ranney, T. P. .... Aberdeen
Rice, D. B. .... Britton
Rudolph, E. A. .... Aberdeen
Sarchet, Geo. .... Mobridge
Spirey, A. W. .... Mobridge
Twining, G. H. .... Mobridge
Whiteside, J. D. .... Aberdeen

WATERTOWN DISTRICT MEDICAL SOCIETY—NO. 2

PRESIDENT

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SECRETARY-TREASURER

Johnson, A. E. .... Watertown

Ash, J. C. .... Garden City
Bartron, H. J. .... Watertown
Bates, J. S. .... Clear Lake
Brown, H. Russell .... Watertown
Christensen, A. H. .... Clark
Freeburg, H. M. .... Watertown
Hammond, M. J. .... Watertown
Hershkowitz, S. T. .... Clear Lake
Johnson, A. E. .... Watertown
Jorgenson, M. C. .... Watertown
Kenney, H. T. .... Watertown
Kilgard, R. M. .... Watertown
Lockwood, J. H. .... Henry
McIntyre, P. S. .... Bradley
Magee, W. G. .... Watertown
Randall, O. S. .... Watertown
Richards, G. H. .... Watertown
Scallin, Paul R. .... Clark
Sherwood, H. W. .... Doland
Sherwood, J. S. .... Doland
Tarbell, H. A. .... Watertown
Vaughn, J. B. .... Castlewood
Watson, E. S. .... Estelline

MADISON DISTRICT MEDICAL SOCIETY—NO. 3

PRESIDENT

Tank, Myron .... Brookings

SECRETARY-TREASURER

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Baughman, D. S. .... Madison
Davidson, Magni .... Brookings
Engelson, C. J. .... Brookings
Gulbrandson, G. H. .... Brookings
Jordan, L. E. .... Chester
Miller, H. A. .... Brookings
Mokler, V. A. .... Wentworth
Sherwood, C. E. .... Madison
Tank, Myron .... Brookings
Tillisch, Henrik .... Brookings
Torwick, E. E. .... Volga
Torwick, E. T. .... Volga
Westaby, J. R. .... Madison
Westaby, R. S. .... Madison
Whitson, G. E. .... Madison

PIERRE DISTRICT MEDICAL SOCIETY—NO. 4

PRESIDENT

Kimble, O. A. .... Murdo

SECRETARY-TREASURER

Robbins, C. E. .... Pierre

Burgees, R. E. ....
Hart, B. M. .... Onida
Jenkins, P. B. .... Pierre
Kimbal, O. A. .... Murdo
McLaurin, A. A. .... Pierre
Martin, H. B. .... Harrold
Morrissey, M. M. .... Pierre
Murphy, Jos. .... Murdo
Orvedahl, F. W. .... Kadoka
Riggs, T. F. .... Pierre
Robbins, C. E. .... Pierre
Ramsey, Guy .... Philip
Salladay, I. R. .... Pierre
Triolo, Antony .... Philip
Zeiss, F. .... Onida

HURON DISTRICT MEDICAL SOCIETY—NO. 5

PRESIDENT

Burman, G. E. .... Carthage

SECRETARY-TREASURER

Buchanan, R. A. .... Huron

Buchanan, R. A. .... Huron
Burman, G. E. .... Carthage
Dyar, Robt. .... Huron
Feige, C. A. .... Canova
*Foxton, J. L. .... Iroquois
Griffith, W. H. .... Huron
Hagin, J. C. .... Miller
Grosvenor, L. N. .... Huron
Pangburn, M. W. .... Miller
Saylor, H. L. .... Huron
Saxton, W. H. .... Huron
Sewell, H. D. .... Huron
Shirley, J. C. .... Huron
Sigler, G. V. .... Marysville, Wash.
Thomas, Benj. .... Huron
Tschetter, J. S. .... Huron
Turner, J. F. .... Miller
Wood, T. J. .... Huron
Wright, O. R. .... Huron

*Honorary

MITCHELL DISTRICT MEDICAL SOCIETY—NO. 6

PRESIDENT

Rohwer, R. T............Mitchell

SECRETARY-TREASURER

Weber, R. A...........Mitchell

Auld, C. V...........Plankinton
Ball, W. R...............Mitchell
Bobb, B. A...............Mitchell
Bobb, C. S...............Mitchell
Case, T. J................Delmont
Cochran, F. B........Plankington
Delaney, Wm. A........Mitchell
Dick, L. C................Spencer
Foster, J. W.....Wess. Springs
Gifford, A. J..........Alexandria
Gillis, F. D...............Mitchell
Jenkinson, H. E....Wess. Springs
Jones, E. W.............Mitchell
Kelly, R. A..............Mitchell
Lloyd, J. H. ....Mitchell
Mabee, Don R...........Mitchell
Mabee, O. J.............Mitchell
Mannion, J. E............Platte
Maytum, W. J.........Alexandria
Navin, K. W...........Mitchell
Nelson, J. A............Howard
Privett, L. B..............Geddes
Rohwer, R. T............Mitchell
Stewart, F. H...........Kimball
Tobin, F. J. ....Mitchell
Waldner, J. L...........Parkston
Weber, R. A...........Mitchell
Young, E. M.............Mitchell

SIOUX FALLS DISTRICT MEDICAL SOCIETY—NO. 7

PRESIDENT

Donahoe, W. E.......Sioux Falls

SECRETARY-TREASURER

Hummer, H. R........Sioux Falls

Baldwin, Grove.....Sioux Falls
Billingsley, P. R.....Sioux Falls
Billion, T. J...........Sioux Falls
Brandon, P. E........Sioux Falls
Carney, J. G. ....Sioux Falls
Carney, Myrtle S......Sioux Falls
Clark, J. C............Sioux Falls
Cottam, G. I. W......Sioux Falls
*Craig, D. W........Sioux Falls
Culver, C. F..........Sioux Falls
Dehli, H. M...............Colton
DeVall, F. C...........Garretson
Dickenson, W. E.........Letcher
Donahoe, S. A........Sioux Falls
Donahoe, Wm. E......Sioux Falls
Dulaney, C. H...........Canton
Eagan, J. B...........Dell Rapids
Engelcke, R. G.........Viborg
Ericksen, E. G........Sioux Falls
Ericksen, O. C........Sioux Falls
Fisk, R. R............Flandreau
Fitzgibbon, I. Gratton........ .... Sioux Falls
Forsberg, C. W........Sioux Falls
Gage, E. E. ....Sioux Falls
Gregg, J. B...........Sioux Falls
Groebner, O. H.......Sioux Falls
Grove, A. F...........Dell Rapids
Hannon, L. J............Hartford
Hanson, O. L......Valley Springs
Hummer, H. R........Sioux Falls
Hyden, Anton........Sioux Falls
Keller, S. A...........Sioux Falls
Kittleson, J. A......Sioux Falls
Lamb-Barger, Hazel H...... ....Sioux Falls
Lanam, M. O. ....Sioux Falls
Larson, M. W..........Hudson
McDonald, C. J.....Sioux Falls
Moe, A. J.............Sioux Falls
Mueller, J. D.........Flandreau
Mullen, R. W.........Sioux Falls
Nessa, N. J...........Sioux Falls
Nilsson, F. C........Sioux Falls
Opheim, O. V.........Sioux Falls
Pankow, L. J.........Sioux Falls
Parke, L. L...............Canton
*Perkins, E. L.......Sioux Falls
*Posthuma, Aune...Sioux Falls
Reagan, R............Sioux Falls
Rider, A. S............Flandreau
*Roberts, W. P.....Sioux Falls
Stenberg, E. S.........Sioux Falls
Stern, M. A...........Sioux Falls
Stevens, Geo. A.......Sioux Falls
Stevens, R. G.........Sioux Falls
Van Demark, G. E....Sioux Falls
VerMeulen, Peter ....Sioux Falls
Volin, H. P................Lenox
Zimmerman, G. E.....Sioux Falls

YANKTON DISTRICT MEDICAL SOCIETY—NO. 8

PRESIDENT

Williams, F. E........Wakonda

SECRETARY-TREASURER

Hohf, J. A. ....Yankton

Abts, F. J..............Yankton
Adams, G. S...........Yankton
Andre, H. C..........Vermilion
Beal, L. F........................Irene
Benesh, L. C. ....Freeman
Blezek, F. M. ....Tabor
Bright, H. F............Elk Point
Brookman, L. J.........Vermilion
Burkland, P. R.........Vermilion
Bushnell, J. W..........Elk Point
Bushnell, W. F. ....Elk Point
Conner, E. L.............Alcester
Crecelius, H. A............Volin
*Cruickshank, Thos. ..Vermilion
Freshour, Ina M.........Yankton
Greenfield, J. C............Avon
Haas, F. W............Yankton
Hanson, H. F..........Vermilion
Haug, L. A.............Beresford
Hyden, Andrew ....Alcester
Hill, John F.............Yankton
Hohf, J. A. ....Yankton
Hohf, S. M.............Yankton
Johnson, Geo. E. ....Yankton
Joyce, E..................Hurley
Kalayjian, D. S. ....Parker
Kauffman, E. J...........Marion
Keeling, C. M.........Springfield
Landmann, G. A.........Scotland
Leonard B. B. Y.........Yankton
Lietzke, E. T...........Beresford
Moore, F. A............Yankton
Morehouse, E. M.........Yankton
Ohlmacher, J. C........Vermilion
Reding, A. P............Marion
Stansbury, E. M........Vermilion
Treirweiler, J. E.........Yankton
Willhite, F. V............Redfield
Williams, F. E........Wakonda
Winegar, D. E. ....Yankton

BLACK HILLS DISTRICT MEDICAL SOCIETY—NO. 9

PRESIDENT

Hummer, F. L..............Lead

SECRETARY-TREASURER

Baker, R. M..............Sturgis

Baker, R. M. ....Sturgis
Bestgen, F. P. ....Sturgis
Butler, J. M........Hot Springs
Clark, O. H...............Newell
Coslett, F. ....Senator
Davis, J. H.........Belle Fourche
Dawley, W. A.........Rapid City
Ewald, Paul P..............Lead
Hare, Carlyle ....Spearfish
Havlicek, T. L. ....Sanator
Howe, F. S...........Deadwood
Hummer, F. L..............Lead
Jackson, R. J.........Rapid City
Jernstrom, R. E. ......Rapid City
Kegaries, D. L.........Rapid City
Mattox, N. E..............Lead
Minty, F. W. ....Rapid City
Morse, W. E..........Rapid City
Morsman, C. F.......Hot Springs
Newby, H. D...........Rapid City
O'Toole, T. F....New Underwood
Owen, N. T............Rapid City
Pemberton, M. O.......Deadwood
Radusch, Frieda J......Rapid City
Stewart, J. L..............Nemo
Walters, C. A.......Belle Fourche
Zarbaugh, Guy F.......Deadwood

*Honorary

ROSEBUD DISTRICT MEDICAL SOCIETY—NO. 10

PRESIDENT

Smith, E. C. .... Mission

SECRETARY-TREASURER

Overton, R. V. .... Winner

Carmack, A. O.	Colome
Jones, J. E.	Rosebud
Kenaston, H. R.	Bonesteel
Malster, R. M.	Carter
Overton, R. V.	Winner
Quinn, R. J.	Burke
Smith, E. C.	Mission
Walters, S. J.	Winner
Wilson, F. D.	Winner

KINGSBURY CO. DISTRICT MEDICAL SOCIETY—NO. 11

PRESIDENT

Rozendahl, P. H. .... Lake Preston

SECRETARY-TREASURER

Peeke, A. P. .... Volga

Bostrom, A. E.	DeSmet
Butler, C. A.	Lake Preston
Dyar, B. A.	DeSmet
Grove, E. H.	Arlington
Hopkins, N. K.	Arlington
Nyquist, R. H.	Iroquois
Peeke, A. P.	Volga
Rozendahl, P. H.	Lake Preston
Scanlon, D. L.	Volga

WHETSTONE VALLEY DISTRICT MEDICAL SOCIETY—NO. 12

PRESIDENT

Karlins, W. H. .... Webster

SECRETARY-TREASURER

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Cliff, F. N. .... Milbank

Duncan, Wm.	Webster
Flett, Chas.	Milbank
Gregory, D. A.	Milbank
Hawkins, A. P.	Waubay
Hayes, Clare E.	Washington, D. C.
Hedemark, T. A.	Revillo
Jacotel, J. A.	Milbank
Judge, W. T.	Milbank
Karlins, W. H.	Webster
Peabody, Percy D.	Webster
Pearson, A. W.	Sisseton
Pfister, Faris	Webster
Porter, O. M.	Sisseton

ALPHABETICAL ROSTER

Abts, F. J.	Yankton
Adams, J. F.	Aberdeen
Adams, G. S.	Yankton
Ahlfs, J. J.	Conde
Alway, J. D.	Aberdeen
Andre, H. C.	Vermilion
Ash, J. C.	Garden City
Auld, C. V.	Plankinton
Baker, R. M.	Sturgis
Baldwin, Grove	Sioux Falls
Ball, W. R.	Mitchell
Bartron, H. J.	Watertown
Bates, J. S.	Clear Lake
Bates, W. A.	Aberdeen
Baughman, D. S.	Madison
Beal, L. F.	Irene
Benesh, L. C.	Freeman
Bestgen, Fred P.	Sturgis
Billingsley, P. R.	Sioux Falls
Billion, T. J.	Sioux Falls
Blezek, F. M.	Tabor
Bobb, B. A.	Mitchell
Bobb, C. S.	Mitchell
Bostrom, A. E.	DeSmet
Brandon, P. E.	Sioux Falls
Bright, H. F.	Elk Point
Brinkman, W. C.	Veblen
Brookman, L. J.	Vermilion
Brown, H. R.	Watertown
Bruner, J. E.	Aberdeen
Buchanan, R. A.	Huron
Bunker, Paul	Aberdeen
Burgess, R. E.	Gettysburg
Burkland, P. R.	Vermilion
Burman, G. E.	Carthage
Bushnell, J. W.	Elk Point
Bushnell, W. F.	Elk Point
Butler, C. A.	Lake Preston
Butler, J. M.	Hot Springs
Calene, J. L.	Aberdeen
Carmack, A. O.	Colome
Carney, J. G.	Sioux Falls
Carney, Myrtle S.	Sioux Falls
Case, T. J.	Delmont
Christensen, A. H.	Clark
Clark, J. C.	Sioux Falls
Clark, O. H.	Newell
Cliff, F. N.	Milbank
Cochran, F. B.	Plankinton
Conner, E. L.	Alcester
Cook, J. F. D.	Langford
Cooley, F. H.	Redfield
Coslett, F.	Senator
Cottam, G. I. W.	Sioux Falls
*Craig, Willard D.	Sioux Falls
Creamer, F. H.	Dupree
Crecelius, H. A.	Volin
Cruickshank, T.	Vermilion
Culver, C. F.	Sioux Falls
Davidson, Magni	Brookings
Davis, J. H.	Belle Fourche
Dawley, W. A.	Rapid City
Dehli, H. M.	Colton
Delaney, Wm. A.	Mitchell
DeVall, F. C.	Garretson
Dick, L. C.	Spencer
Dickenson, W. E.	Canistota
Donahoe, S. A.	Sioux Falls
Donahoe, Wm. E.	Sioux Falls
Dulaney, C. N.	Canton
Duncan, Wm.	Webster
Dyar, B. A.	Pierre
Dyar, Robert	Huron
Eagan, J. B.	Dell Rapids
Eckrich, J. A.	Aberdeen
Elward, R. L.	Ashton
Engelcke, R. H.	Viborg
Engelson, C. J.	Brookings
Ericksen, E. G.	Sioux Falls
Ericksen, O. C.	Sioux Falls
Ewald, P. P.	Lead
Farrell, W. D.	Aberdeen
Feige, C. A.	Canova
Fisk, R. R.	Flandreau
Fitzgibbon, Graton T.	Sioux Falls
Flett, Chas.	Milbank
Forsberg, C. W.	
Foster, J. W.	Wess. Springs
*Foxton, J. L.	Iroquois
Freeburg, H. M.	Watertown
Freshour, Ina M.	Yankton
Gage, E. E.	Sioux Falls
Gelber, M. R.	Aberdeen
Gerdes, O. H.	Eureka
Gifford, A. J.	Alexandria
Gillis, F. D.	Mitchell
Graff, L. W.	Britton
Greenfield, J. C.	Avon
Gregg, J. B.	Sioux Falls
Gregory, D. S.	Milbank
Griffith, W. H.	Huron
Groebner, O. H.	Sioux Falls
Grosvenor, L. N.	Huron
Grove, A. F.	Dell Rapids
Grove, E. H.	Arlington
Gulbrandson, G. H.	Brookings
Haas, F. W.	Yankton
Hagin, J. C.	Miller
Hammond, M. J.	Watertown
Hannon, L. J.	Hartford
Hanson, H. F.	Vermilion
Hanson, O. L.	Valley Springs
Hare, Carlyle	Lead
Hart, B. M.	Onida
Haug, L. A.	Beresford
Havlicek, T. L.	Sanator
Hawkins, A. P.	Waubay
Hayes, Clare E.	Washington, D. C.
Hedemark, T. A.	Revillo
Hershkowitz, S. T.	Clear Lake
Hill, John F.	Yankton
Hill, Robert	Ipswich

*Honorary

Hohf, J. A.	Yankton
Hohf, S. M.	Yankton
Hopkins, N. K.	Arlington
Howe, F. S.	Deadwood
Hummer, F. L.	Lead
Hummer, H. R.	Sioux Falls
Hyden, Andrew	Alcester
Hyden, Anton	Sioux Falls
Jackson, R. J.	Rapid City
Jacotel, J. A.	Milbank
Jenkins, P. B.	Pierre
Jenkinson, H. E.	Wess. Springs
Jernstrom, R. E.	Rapid City
Johnson, A. E.	Watertown
Johnson, G. E.	Yankton
Jones, E. W.	Mitchell
Jones, J. E.	Rosebud
Jones, T. D.	Bowdle
Jordan, L. E.	Chester
Jorgenson, M. C.	Watertown
Joyce, E.	Hurley
Judge, W. T.	Milbank
Kalayjian, D. S.	Parker
Karlins, W. H.	Webster
Kauffman, E. J.	Marion
Keegan, Agnes	Aberdeen
Kegaries, D. L.	Rapid City
Keeling, C. M.	Springfield
Kellar, S. A.	Sioux Falls
Kelly, R. A.	Mitchell
Kenaston, H. R.	Bonesteel
Kenney, H. T.	Watertown
Kilgard, R. M.	Watertown
Kimball, O. A.	Murdo
King, H. I.	Aberdeen
Kittleson, J. A.	Sioux Falls
Kraushaar, J. O. F.	Aberdeen
Lamb-Barger, Hazel H.	Sioux Falls
Lanam, M. O.	Sioux Falls
Landmann, G. A.	Scotland
Larson, M. W.	Hudson
Leonard, B. B.	Yankton
Lietzke, E. T.	Beresford
Lloyd, J. H.	Mitchell
Lockwood, J. H.	Henry
Lowe, C. E.	Mobridge
Lundquist, C. G.	Leola
McCarthy, P. V.	Aberdeen
McDonald, C. J.	Sioux Falls
McIntyre, P. S.	Bradley
McLaurin, A. A.	Pierre
Mabee, Don R.	Mitchell
Mabee, O. J.	Mitchell
Magee, W. G.	Watertown
Malster, R. M.	Carter
Mannion, J. E.	Platte
Martin, H. B.	Harrold
Mattox, N. E.	Lead
Mayer, R. G.	Aberdeen
Maytum, W. J.	Alexandria
Miller, H. A.	Brookings
Minty, F. W.	Rapid City
Moe, A. J.	Sioux Falls
Mokler, V. A.	Wentworth
Moore, F. A.	Yankton
Morehouse, E. M.	Yankton
Morrissey, M. M.	Pierre
Morse, W. E.	Rapid City
Morsman, C. F.	Hot Springs
Mueller, J. D.	Flandreau
Mullen, R. W.	Sioux Falls
Murdy, B. C.	Aberdeen
Murdy, R. C.	Aberdeen
Murphey, T. W.	Bristol
Murphy, Jos.	Murdo
Navin, K. W.	Mitchell
Nelson, J. A.	Howard
Nessa, N. J.	Sioux Falls
Newby, H. D.	Rapid City
Nilsson, F. C.	Sioux Falls
Nyquist, R. H.	Iroquois
Ohlmacher, J. C.	Vermilion
Olson, C. L.	McIntosh
Olson, C. O.	Grotton
Opheim, O. V.	Sioux Falls
Orvedahl, F. W.	Kadoka
O'Toole, T. F.	New Underwood
Overton, R. V.	Winner
Owen, N. T.	Rapid City
Pangburn, M. W.	Miller
Pankow, L. J.	Sioux Falls
Parke, L. L.	Canton
Peabody, Percy D.	Webster
Pearson, A. W.	Sisseton
Peeke, A. P.	Volga
Pemberton, M. O.	Deadwood
*Perkins, E. L.	Sioux Falls
Pfister, Faris	Webster
Pittenger, E. A.	Aberdeen
Porter, O. M.	Sisseton
*Posthuma, Aune	Sioux Falls
Potter, G. W.	Redfield
Privett, L. B.	Boise, Idaho
Quinn, R. J.	Burke
Radusch, Frieda	Rapid City
Ramsey, Guy	Philip
Randall, O. S.	Watertown
Ranney, T. P.	Aberdeen
Reagan, R.	Sioux Falls
Reding, A. P.	Marion
Rice, D. B.	Britton
Richards, G. H.	Watertown
Rider, A. S.	Flandreau
Riggs, T. F.	Pierre
Robbins, C. E.	Pierre
*Roberts, W. P.	Sioux Falls
Rohwer, R. T.	Mitchell
Rozendal, P. H.	Lake Preston
Rudolph, E. A.	Aberdeen
Salladay, I. R.	Pierre
Sarchet, Geo.	Mobridge
Saxton, W. H.	Huron
Saylor, H. L.	Huron
Scallin, P. R.	Clark
Scanlon, D. L.	Volga
Sewell, H. D.	Huron
Sherwood, C. E.	Madison
Sherwood, J. S.	Doland
Sherwood, H. W.	Doland
Shirley, J. C.	Huron
Sigler, G. V.	Marysville, Wash.
Smith, E. C.	Mission
Spirey, A. W.	Mobridge
Stansbury, E. M.	Vermillion
Stenberg, E. S.	Sioux Falls
Stern, M. A.	Sioux Falls
Stevens, Geo. A.	Sioux Falls
Stevens, R. G.	Sioux Falls
Stewart, F. H.	Kimball
Stewart, I. L.	Nemo
Tank, M.	Brookings
Tarbell, H. A.	Watertown
Thomas, Benj.	Huron
Tillisch, Henrik	Brookings
Tobin, F. J.	Mitchell
Torwick, E. E.	Volga
Torwick, E. T.	Volga
Trierweiler, J. E.	Yankton
Triolo, Antony	Philip
Tschetter, J. S.	Huron
Turner, J. F.	Miller
Twining, G. H.	Mobridge
Van Demark, G. E.	Sioux Falls
Vaughn, J. B.	Castlewood
Ver Meulen, Peter	Sioux Falls
Volin, H. P.	Lenox
Waldner, J. L.	Parkston
Walters, C. A.	Belle Fourche
Walters, S. J.	Winner
Watson, E. S.	Estelline
Weber, R. A.	Mitchell
Westaby, J. R.	Madison
Westaby, R. S.	Madison
Whiteside, J. D.	Aberdeen
Whitson, G. E.	Madison
Willhite, F. V.	Redfield
Williams, F. E.	Wakonda
Wilson, F. D.	Winner
Winegar, D. E.	Yankton
Wood, T. J.	Huron
Wright, O. R.	Huron
Young, E. M.	Mitchell
Zarbaugh, G. F.	Deadwood
Zeiss, F.	Onida
Zimmerman, G. E.	Sioux Falls

*Honorary

I Am Automatic*

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I USUALLY say that I began January 20, 1867, at 4:20 p. m. This statement is made on the assumption that exactly nine months elapsed between fertilization and parturition. Since this assumption may be unwarranted it seems more scientific to say that at or near the moment specified, a certain sperm cell joined a certain egg cell and I began. Many other sperm cells were in the neighborhood, and numerous brothers and sisters of mine who might have been never were because my sperm cell won the race. I began and was and am. All the others were potential and never were.

These remarks have been formulated in facetious vein. Nevertheless that the moment was fraught with fate and that the outcome was determined by chance and such biological factors as chemotropism, rheotropism and ciliary action, all of which are reckoned in the category of automatic response, will be admitted by all biologists.

The fertilized ovum that was me promptly hunched itself together and divided into two cells. The word "mitosis" arouses no thrills in your case-hardened thinking. But really as it marches from stage to stage in majestic parade, cell-division is a most wonderful example of rhythmical automatism. Of the chemistry and physics, the forces and energies here manifest we know all too little. But that what happens and will happen is inevitable in what is and was—this is clear to any observer. These are the qualities of automatic mechanism.

I shall not review the stages I went through in the next nine months. Biologically they are summarized under the meaningful titles of cell-division, metabolism, growth, differentiation. All these words have a connotation of automatism, summed up, perhaps, in that most incisive question: "Which of you by taking thought can add one cubit unto his stature?" None of them conveys any implication of volition.

After about three weeks my heart began to beat. Stated thus this intriguing fact arouses no thrill. But if I should put it the other way and say that I once lived three weeks without a heart beat, I should expect Ripley to come clamoring at my door.

I understand also that I developed three types of kidney, pronephros, mesonephros and metanephros; that successively I used and abolished one, and made some secondary use of another. The last named I kept and am still using.

These facts have no interest to me except as indicating that I was the seat of tremendous activities and that each stage was a factor in determining the next stage. That as I have said is the characteristic of an automatic mechanism.

When I began I weighed perhaps three or four thousandths of a milligram. In nine months I had increased in weight something in the order of a billion times. My mother had nothing to do with this except to furnish usable material, a suitable temperature and other external conditions. I set a vast array of rootlets, the chorionic villi, deep in her uterine mucosa and systematically appropriated diffusion products from her circulation. Among these were some hormones, but not a single nerve fiber connected me to her. I was a parasite as separate from her as a tape worm.

My growth was automatic but it was not uniform. If you look at a fetal growth curve, you will get a dim vision of the material, mechanical and chemical difficulties which limit growth and finally determine the maximum for a given individual or species. These limiting factors are as automatic as the growth process itself.

At the proper time I was born. I am aware of no scientific argument that up to that time any other than automatic forces had operated in establishing what I was or what I could do. I was an automatic, colloidal machine.

And now by some process—intuitive, but not so very intuitive!—I find some of you thinking: "Here is a plea for determinism. This man would destroy the freedom of the will. He is attempting to undermine personal responsibility. He is attacking the most sacred strongholds of social order, the basis of law, the foundation of religion."

"Not at all," I hasten to demur. Far be it from a physiologist—especially a quondam, degenerate physiologist—to say anything contrary to prevailing dualism. On the contrary he accepts it. He proclaims himself a disciple. He hastens to disclaim even the appearance of heresy.[1]

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(At this point a parenthesis is needed. When a preliminary copy of this paper was read by my psychologist friends they plastered it with indignant, even pained, comments. "Ghost soul," said one. "I am surprised," wrote another. "Dean Lyon's Ego has been agglomerated into a narcosis," snapped a third. To point in rejoinder to a subtle tinge of "doth protest too much" in the preceding paragraph is to suggest that the psychologists missed something. I suspect they take life too seriously. I will, therefore, only add that the paragraph may stand for the present. We shall see where we come out in the end.)

For at some time, there appeared—or appeared to appear—in me a force or influence or being, which to many people by intelligent consideration, to all by act of instinct, seems not to fall in the category of automatism. You may call it volition. I shall call it Ego. At some time Ego, a non-automatic entity, came to live with me, who am pure automatism. For many years Ego and I have been joint tenants.

Just when this relationship began may be a matter of controversy. My only living aunt, now 93 years old, a witness of those early scenes, whom I recently consulted, believes firmly that I was born with a will of my own. She says even from the first day I wouldn't be satisfied until I got what I wanted.

I quote from her recent letter for the benefit not alone of the philosophically minded but also such earthly creatures as pediatricians who may have strayed by accident into the sleepy atmosphere of a physiological meeting: "That baby got me up in the night by crying so lustily for someone to feed him, so I took a large soda cracker and poured boiling water on it, mixed in a little sugar and a spoonful of cream. I fed him all the juice from this and rocked him to sleep." You will note that she gave me carbohydrate and fat, a modicum of proteins, but forgot entirely the irradiated ergosterol.

The modern pediatrician would consider me doomed from that moment. Probably I was.

You note too, in my aunt's words, the implication of will on my part. She thinks I knew what I wanted and was bound to get it. For myself I am more inclined to believe in inherited reflexes and attribute my behavior on that first day to my automatic make-up.

However, it is sufficient that I admit the arrival of Ego—the same fellow of whom spoke René Descartes in the familiar words, "Cogito, ergo sum." There is no need at this late date to debate the time of beginning his tenancy.

Now the purpose of this paper—apart from furnishing amusement for an otherwise dead serious gathering—is to show the comparative insignificance of Ego and to magnify the importance of "me." I am automatic. He is or thinks he is something else. Ordinarily Ego gets all the kudos, I am passed up as simple mechanism. Simple! This idea of simplicity makes me boil with indignation, for I think I am decidedly the more interesting and believe, if I had time, I could demonstrate my greater importance.

I am automatic. I am involuntary. Everything that is involuntary belongs to me. This is the thesis of this address.

What can Ego do? Well, first he seems to control the voluntary muscles. Whatever of commission or omission the human will may accomplish, whether in the simple act of lifting the pen with which these words are written, or in the command of a million men to engage in combat or in such act of negation as that of Stalin (according to Chamberlin), when he let the famine of '32 "run its course"—every act or failure to act, I say, is concerned in final analysis with contraction or inhibition of the voluntary muscles.

(Here again I need a parenthesis. Opposite the foregoing paragraph my psychologist friend wrote "I doubt this statement." I have reconsidered it and let it stand. The psychologist is doubtless a more experienced introspectionist than I am. But it seems to me this very act of attention, seemingly willed, by which I decided to let the statement stand is in essence an inhibition of voluntary muscles. If I had decided to delete, action of such muscles would be manifest. "Let it stand.")

But are these voluntary muscles themselves voluntary? To demonstrate that they are not requires only the most superficial consideration. Striated muscle is about the most passive structure in the body. It does nothing of that which is considered its normal function unless it is set going, that is stimulated, by some external energy. Like an automobile warmed up and ready to go, my biceps might stay in its heated garage from birth day to death unless nerve impulses or what we call external stimuli came in to release its energies. There is nothing voluntary about voluntary muscle.

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[1] That such "heresy" was not always safe, even in modern times, is illustrated by the experience of Setchenov, known as the "Father of the Russian School of Physiologists" and predecessor of Pavlov. In 1866 the sale of his book, "Reflexes of the Brain," was forbidden by the Petersburg Censorial Committee. Furthermore, this committee appealed to the Attorney General of the Petersburg High Court of Justice for the indictment of Professor Setchenov and the confiscation and destruction of his book on the grounds that this book "undermines the moral foundations of society; . . . destroys the religious doctrine of eternal life and . . . leads to the corruption of morals." After a year's consideration the Attorney General refused action.

Looked at, indeed, from the standpoint of both structure and operation striated muscle is a preeminent example of automatic mechanism. Here it stands ready, doing nothing except keep up its minimum life processes, which it does automatically. As one would say of an automobile engine, it is "idling." Arrives a nerve impulse. Then something happens. Following recent researches the immediate sequence may be like this: A dissociable compound, perhaps phosphocreatine, splits into smaller molecules. Osmotic pressure is increased, water is absorbed. Structural elements swell and shorten.

The idea is that a sequence of events is set going leading to contraction. But it does not stop there, although what Ego "wants," when he starts the sequence is merely that very contraction. The follow-up processes seem even more complicated, more manifestly automatic. The relaxation paradoxically involves greater activity than the contraction.

The explosive has to be reconstructed. This is a synthetic process and requires energy. It is during relaxation that CO_2 is produced, oxygen used, most of the heat liberated. The lactic acid-glycogen cycle comes in here.

We will not attempt to follow the complex and to some extent hypothetical chemistry of the recovery process. But other things equally important are going on. More oxygen must be supplied. Carbon dioxide is to be gotten rid of. The capillaries open up. More blood comes. Breathing is increased. There is the important matter of muscle tonus without which the contractile process would be feeble and inefficient. There is the involved reflex mechanism of reciprocal innervation. Many of these regulatory processes are confined to the muscle. Others involve distant structures.

Moreover there are the constant processes of repair of the mechanism itself, processes for which it is impossible to find good analogies in man-made machinery but for which some analogies exist in non-living systems, the repair of crystals for example. These repair processes involve the protein basis of the machine. Little is known of detail, but that constant reconstruction goes on is apparent. The maintenance property of protoplasm is one of its prominent characteristics.

All these elements of the metabolism and activity of striated muscle go on—must go on. And all are automatic. They are mine. They are part of me.

The blood is a complex, self-regulating system which illustrates in numerous ways the thesis of this paper. There is the maintenance of the red corpuscle content. Which of you by taking thought can add one red corpuscle to his total? Yet each of you—I calculate from the best available figures on bile pigment formation—adds 10,000,000 red corpuscles to his blood each second of adult life. The red marrow of your bones is the busiest factory on earth. Think of the rush hours when you go up on a mountain! Think of the hurry and scurry after a hemorrhage!

Or let your imagination run among the leucocytes. Consider their gathering at foci of infection or about any foreign body, their relation to immunity, the complex interrelations of the reticulo-endothelial system.

Or contemplate the hydrogen ion concentration to be maintained within proper limits at all times. The matter of buffers is quite as interesting as Communism or Naziism or the New Deal, and vastly more important to your personal welfare.

Or view the complicated process of coagulation. Think of it as ever-ready like an automatic sprinkler fire extinguisher, almost never used, yet very essential. Without it your life insurance premiums would go up as would the fire insurance on an unprotected building.

And now let Ego, if he dare, get up on my hind legs and say that he can by wishing, willing, or wailing, influence one iota any one of these processes. They are automatic. They are mine. They are part of me.

Did time permit I could compose panegyrics on the heart-beat and control of blood volume, pressure, circulation and distribution, the coronary flow and so on. But you can exercise your own imagination in this field. It will do you good, cardiologists and other internists, as you confront your problems during sleepless nights and anxious days.

You can see also how I might go on with the chapters on respiration, digestion, excretion, heat regulation. The autonomic—mark well that word! —the autonomic nervous system to be considered here today would give me ample texts, as would the related endocrines. I sometimes take malicious joy in asking Ego where *he* would be if *my* thyroids went blooey. I will, however, close this part of my talk with a few sentences on reproduction.

That the essential mechanism of fertilization is automatic should be sufficiently clear from what I have said. That all the processes by which the germ cells are produced and matured are automatic is manifest. That the secondary mechanisms by which ovum and sperm are brought in proximity involve reflexes is common knowledge. But whether that part of the process which involves the striated muscles is voluntary or automatic is a question which Ego and I frequently discuss and never settle. In such situation it is permitted to bet. My bet is that papa Dionne did not voluntarily set himself about the creation of quintuplets.

During the remaining few minutes I propose a foray into the very trenches and dugouts of my friend and enemy, Ego. I propose to follow him into the fastnesses of the central nervous system itself.

That the entire makeup of this system has resulted from the automatic processes of growth and differentiation and that, by the time Ego is on the job, nothing fundamental remains to be done will be conceded. Which of you by taking thought can add one neurone? "Not I," says each of you. And I think you would be equally unanimous if I asked about new synapses, those all important connections between nerve cells by which is determined what the mechanism can do.

Next there is the vast array of activities called reflexes. The very name which Descartes borrowed from physics implies their automatic character. If this is acknowledged, we have chased Ego pretty well home to the cerebral cortex. Let us follow him there.

Consider conditioned reflexes. These involve the cortex and constitute in the opinion of Pavlov and numerous psychologists the elements of many, perhaps all, types of behavior. The conditioned reflex I am most conscious of is watering of the mouth. When I see a cherry pie "like mother used to make" I drivel like an infant. This experience is, to me, as involuntary as the knee jerk. Granted that Ego may in a sense and to some extent determine what pathways are to be smoothed and "facilitated," when the highways of habit have been established I claim supervision and control of traffic.

And now I find myself compelled to resort to a method in which physiologists have little confidence, that of introspection. It may be, indeed, a method which you will deny me, who am pure automatism, the privilege of using. If you demur, I ask that Ego and I operate it together.

When Ego and I get on the inside of ourself and attempt to see what is going on we make some interesting observations. I for my part can not get away from the impression that the entire afferent side of our experience is involuntary. If some part of me is injured, pain results. This again is as inevitable as the knee-jerk. In fact the analogy of reflex and sensation has always intrigued me.

A nerve impulse enters the central nervous system, rambles over certain intermediary neurones, crosses certain synaptic unions, rambles out over an efferent pathway, sets up a motion or secretion. We call this sequence a reflex and say it is automatic.

Suppose an impulse rambles over a different set of neurones, crosses different synapses, leaves the primary center, arrives at a definite part of the cortex. There results a sensation, not a motion or secretion. To me the result is different only because the impulse arrives at a different place, a differently constructed organ. Indeed, to me sensation is qualitatively different from contraction in the same sense as contraction is different from secretion. If the mass of grey matter we call cerebral cortex were located entirely away from the rest of the nervous system—say in the belly—and connected with the rest by one of those long cables of afferent and efferent fibers we call nerves, my comparison of sensation and reflex would be clear to all.

Anyway sensations seem involuntary, therefore automatic. I hereby record a mortgage on this field of mental activity. I admit that Ego has a certain equity. For example, he can direct my eyes here and there by act of volition. He can close my eyelids and refuse to let me see anything. But if my eyes are open, the sequence of events by which light sets up sensation and sensation itself are as inevitable and automatic as the constriction of the pupil. This is my claim, and Ego has never been able to convince me to the contrary.

Since this is so I may as well be pilloried for a sirloin as a hamburger and confess my ideas of consciousness itself. I understand psychologists—or some psychologists—have dismissed consciousness entirely from the category of phenomena to be investigated and explained. But Ego and I when we go rambling through our domain find it as an intermittent but hallowed possession.

It is a case of now we have it and now we don't. One third of the time Ego and consciousness go off the job. Already in 68 years Ego has slept longer than Rip Van Winkle. I put him to sleep, for sleep is an involuntary thing. Witness soldiers sleeping on the march, learned doctors nodding during a meeting. Yes, sleep is automatic and comes or does not come in accord with the condition of the machine.

Now every time Ego and I, in our calmer and friendlier moments, go into an introspective huddle on this matter we decide that consciousness is an involuntary activity. If so, I say it is automatic. Ego chokes up but eventually swallows the bitter pill.

Finally thought itself, the generation of ideas! Ego thinks that he thinks. I think that I think. I admit, for the sake of argument, that Ego directs me to think, sets me down, for example, at this desk and says: "Get busy. Just yesterday Lord Fishbein gave orders that this paper be finished by May 20th."

But when I ask myself whether Ego has anything to say about what shall come out of the thinking process, I cannot see that he has any control whatsoever. My thinking is spontaneous, automatic. One idea generates another in inevitable sequence. Like the chemical changes of muscle contraction, or the secretion of gastric juice, or the beat of the heart, so is thought automatic. Neither Ego nor I knew what we were going to say when we started this paper, and neither he nor I know at this moment how we are going to stop.

Ego describes himself in that Who's Who of words, the Century Dictionary, as that which "thinks, feels and wills." I have tried to strip off the first two attributes. I leave him before you as naked Will. This takes him down a peg or two, for Ego is constitutionally an egotistical cuss. I leave him free—*free* to meet the inevitableness of an automatic universe.

(Here again a parenthesis for the benefit of those troublesome psychologists. They decorated my original manuscript with comments to this effect: "Why admit an Ego, and then reduce him to microscopic proportions and leave him in a hole?" Why indeed? Let us put it down to automatic perversity.)

Indeed, at this stage I may as well admit that as a matter of intelligent consideration I cannot see how the will can be free. I cannot make free will conform to the laws of thermo-dynamics. But I get pleasure out of feeling that it is free. And this paper is written from the standpoint of feeling and for the fun of it. I just wanted to see how far, admitting the freedom of will, I could get everybody to go along the automatic road.

Besides, there is my good friend, the professor of philosophy. He says the will is free, and he is an able thinker. It is true I cannot follow his thinking, but that may be my fault. "The jewel has facets, and it is possible that many religions are moderately true." Thus spake the lama in that fascinating book, "Lost Horizon." It is possible that many philosophies are moderately true, say I.

There is further the principle of indeterminacy which, I understand, occupies an important place in the theory of the new physics and has some observational foundation. This principle has been stated in these words: "An electron may have position or it may have velocity, but it cannot in any exact sense have both." To me, accustomed through long years to Newtonian physics as applied to molecules, baseballs, planets, this doesn't mean anything definite.

However, I dimly sense events which cannot be prophesied, something which seems to deviate from the ordinary law of cause and effect. In some way, I gather, the Newtonian differential equation of motion fails to function. The electron has a "will of its own"—at any rate, according to some people.

Well, the best I can get out of the situation is this: If electrons have free will, why did evolution have to strive through ages to create the higher mammalian cerebral cortex in whose activity alone, if the electrons be excepted, something which may be interpreted as free will may be demonstrated? If I cannot find a better basis for morals than the inferred behavior of the electron, I shall—sadly, of course—be compelled to continue unmoral.

Anyway why settle an age-old controversy before a lot of doctors merry-making at Atlantic City? Let us be satisfied with the familiar saying of Schopenhauer: "A man can surely do what he wills to do, but he cannot determine what he wills," whatever that may mean.

In closing may I illustrate by the very fact of my being here the central thought of this paper. Two years ago the American Medical Association met in Milwaukee. I was not present. Afterwards someone remarked that I had been elected to an office. What it was he didn't remember—except that it was not treasurer. Later I found out I was vice-chairman of this section. Note how this event, wholly involuntary on my part, operating through the machinery of the Association, determined my presence on this platform today. That it was not a matter of "deliberate choice" seems self-evident. I suspect it was automatic.

It would have been easy to have selected for this occasion some innocuous subject such as the "Relation of Vitamins to Capitalistic Economy"—a pertinent and timely subject. But I considered that here was an audience that couldn't defend itself and that deserved to be amused—I here had in mind the rest of the program—and decided (or Ego did?) to develop certain ideas which have long awaited an occasion and an audience.

As for you who have been compelled—automatically—to listen, I can add only what is already too clear, namely, there is nothing in this talk that will improve your practice, nothing you can peddle. But I should like to leave this thought in your minds: Protoplasm is preeminently automatic. It works only within the possibilities of its hereditary constitution. This ensures the continuity of species and the conformity of organisms to type. But protoplasm may change, may be changed. This property is the basis of evolution and the basis upon which environment may modify hereditary disposition. To the extent that the former property is dominant—to the extent that protoplasm is rigid like steel—to that extent medicine is helpless before life processes. It is within the range of the second category that medicine must work. Admittedly it is a narrow range. The greatest power in healing is still that which you denominate *vis medicatrix naturae*. This is the automatic, hereditary factor. But there is the possibility of some change, and it is within this restricted physiological limit that your triumphs have been won and will be won. It is to the lasting credit of medicine that in the face of such unchangeableness, such rigidity, such disposition of life to run in predisposed automatic channels, it has won astonishing victories.

The Wish to Fall Ill*

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THE people who do not talk or think enough about the advantage of being ill are the doctors. It is not much discussed in general medical circles. Let me go on to illustrate a number of different aspects of the wish to fall ill, beginning with the most complicated and ending with the most simple. The term, "conversion neurotic," which I shall have to quote and use, of course describes a person who manages to convert disagreeable emotions into physical terms, by some mechanism hidden from himself.

I turn first to a book on *Psycho-Analysis and Medicine*, by Dr. Karin Stephen, of England. Its sub-title is the "Wish to Fall Ill." In her Freudian presentation she cites the case of an unmarried woman who had severe abdominal pains. Appendix and ovary had been removed without giving any relief. In analysis it became evident that the pains stood for two things—childish sexual feelings and the pangs of labor. Somewhere in the patient's hidden thinking was the idea: "No one can blame me for having these pains which make me so miserable, and so I can get a forbidden sex pleasure." Really the pains combined about seven wish fulfillments, which Dr. Stephen enumerates, and which are somewhat inconsistent with each other. The patient who had them really desired infantile rather than adult things. Such summary does little justice to Dr. Stephen's long account. According to her comments, the pains (and all conversion neuroses) "are as purposive as putting up an arm to ward off a blow."

It seems necessary each time that I consider some specialized way of looking at the situation to glance at the treatment which goes along with it. Here the treatment is analysis. As the author says, "the attempt to undo the unconscious attitudes and unnecessary safeguards of a life-time." "A colossal task," years of time, expense running into thousands of dollars. Evidently it is not at the disposal of the average patient, or in the list of services which a college can furnish to a student, or which a hospital can give to an outpatient.

And now I turn to a way of looking at this matter which is not so complex. Adler and his disciples show how easy it is for the idea—"I don't want to do this disagreeable thing" to be replaced by the idea—"I can't do it." "When a man's early conditioning factors lead him to believe that he is incapable of joining with his fellows in ordinary social life he must establish a set of extenuating circumstances which tend to exonerate him from all blame for his personal failure. To do this he must first deceive himself." He finds himself physically sick, with real pain perhaps. "He says 'No' to life with his sinus, heart, his skin or any other organ which happens to be the loud speaker of his soul." "When a neurotic has a physical symptom he goes to the doctor not for cure but for confirmation of illness."

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*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, Dec. 27, 1935.

†Professor of Psychiatry, University of Pennsylvania.

In treatment, Adler thinks that some patients gain helpful insight from a few interviews with a physician, from reading or study. Some outgrow their neuroses. The physician must offer sympathetic understanding, re-education, extension of mental horizons, encouragement to face reality. "Given an understanding of the neurosis or the desire to find a better way, and the encouragement of one other human being, and anyone can modify or minimize his neuroses."

Certainly this therapy of Adler's is to be described as more optimistic and more superficial than Freud's, and more easily applicable to patients.

In the December Atlantic Monthly a three-page article broadcasts the following attitude about the neurotic to lay readers. "In general the people who build up neuroses find the demands of society too much for them." "Illness is cultivated and cherished." "The neurotic has a painful alibi for the conflict which is supposedly too difficult for him."

And a somewhat dubious statement follows. "There is always a failure in the neurotic's reckoning, and if we can bring him to understand this failure we have satisfied the chief condition of his cure." Unfortunately I know neurotics who understand their neurosis and who are not well.

Here are verbatim records of a patient's words to an associate of mine last week. "When I return to college I am sure to be sick. Nowadays I get the 'flu' or colds. I try to get something. And last time when I knew I had big responsibilities waiting at home I got a fine cold."

And on the same day a 14-year-old girl said, "I had pneumonia at 12. I must have wanted it because I was tired out and needed a rest."

You know there is a curious feeling in many of us (especially in the conscientious) that it is wrong to rest. Work is praiseworthy; fatigue is admirable; rest is wrong, recreation is wrong. It has been observed that Americans think that a man in motion is morally better than one who is sitting down. Only when you are sick, is it all right to rest. The late Clarence Day wrote this poem:

In Eastern lands the holiest gents
Are those who live at least expense;
They barely speak, they seek release
From active life in prayer and peace,
But in the Western Hemisphere
A saint must reach the public ear
And dust about and shout and bustle,
Combining holiness and hustle.

It is to the great credit of Dr. Riggs that he has raised the banner of a balanced life in which work, play and rest have their proper parts.

The physiologist, Pavlov, has an explanation of the conversion neurosis, in irradiations of excitement in the cortex. Certain nerve cells can stand only so many stimuli to the minute. So when a student, excited by trouble at home, worried about studies, becomes blind just before an examination, it is because visual cortical cells are broken by excessive stimulation—they are weak links in that student's nerve chain. Of course, areas in the cortex have become conditioned—are areas of excitation or inhibition.

Now let us turn to a very different aspect of the subject and consider the autonomic nervous system which directly links emotions with bodily changes. When an emotional craving is prevented from acquiring the stimuli which would lessen its tension, something happens to the organs concerned which is important. If intense hunger in a child at the family dinner table is expressed in contractions of the stomach walls, and if the hunger cannot be satisfied by the intake and digestion of food because the child is full of fear of the parents, then two differing instinct-emotions are struggling for the possession of the same organ—and gastritis results. So come nervous indigestions, colitis, dysmenorrhea, headache. Kempf speaks of repressed emotions stored like a coiled spring in the heightened postural tension of the autonomic apparatus—our deepest secrets are perhaps filed away as habitual postural tensions.

Here conflict is expressed, not in terms of Conscious and Unconscious, but in terms of anatomy and physiology. The patient, caught between two half-controlled and antagonistic parts of his nervous systems, is swept along by biological forces to things he knows nothing about, and this makes us wonder if the expression, "The Wish to Fall Ill" is always fair to the patient.

The physiologists who have studied the autonomic nervous system have not primarily been concerned with treatment. Here, however, is an illustration of the treatment of a conversion symptom by an internal secretion which is part of the autonomic system.

A married woman of 37 had dysmenorrhea, constipation, laziness: she projected all of her difficulties upon her husband and upon her doctors. Thyroid extract relieved her symptoms, renewed her energy, allowed her to benefit by occupational and other therapy and probably saved her husband from a breakdown.

Another case shows treatment by change of situation, and change of emotion. A young woman, bored and saddened by a routine job of selling shoes, had a gastro-intestinal tract which almost quit work. X-ray plates showed a remarkable stasis. The girl's one interest was in reading about aviation. When she got a job selling tickets on a flying field, occasionally being taken up on trial flights, the gastro-intestinal tract under the influence of happiness worked perfectly.

Simple situations follow.

A young woman took extra hot baths to become ill. When she was sick in bed, when her mother stayed near, when the doctor was in attendance, she was a delightful person. When she was well enough to be up and about, she was devilish.

A college girl still is resentful because she remembers that when she had illnesses as a little girl her mother read to her, waited on her, brought her nice things to eat, but, later when she convalesced, her mother withdrew all these attentions.

A child refused to stop playing and go to bed. When he saw that he was to be made to stop, he played so violently that he hurt himself—which delayed going to bed for some minutes.

And on the conscious level, a conscript to avoid military duty, deliberately cuts off a finger

We have run the gamut from a consideration of deep and unconscious wishes, to the fully conscious and obvious search for the advantages of illness. But this important Wish to Fall Ill is not the only one. Before a doctor can come to the conclusion that this wish is controlling in any patient, he must consider other factors—other wishes and the organic situation.

What seems to be functional may turn out to be organic. Without a complete physical examination, any diagnosis is founded on sand. With an examination there is still the possibility that some "silent" organic disease is present—such a disease as tumor of the pancreas or the frontal lobe of the brain. However there is often a circle of neurotic symptoms around an organic lesion.

Taking a final look at the "Wish to Fall Ill" we can consider it as a part of a fundamental regression. With a tendency to advance (?), to force ourselves on relentlessly to higher educations and to more and more complicated civilizations, goes a tendency in the reverse direction—back to the land, the simple life—back to the old days—back to the South Seas—back to illness.

Dr. Palmer offers me an illustration from his practice. A college athlete of varsity calibre, had a sore throat and influenza. During his convalescence doctors examined him repeatedly for lung abscess or damage to his heart. His mother took him home, put him to bed, read to him, gave him warmed milk every two hours by spoon, a pill every hour. He could not raise his head from the pillow. He had gone back to being a baby in a crib. Brought to the Institute, carrying a small drug store with him, entering on a stretcher, he was playing tennis vigorously in a week.

So far I have been trying to give a somewhat unbiased survey. In closing I shall advance some of my own opinions about what a doctor can do when a student who has "wished to be sick"—or a student in danger of so wishing—comes to the college medical office or infirmary.

The college physician should have easy access to a psychiatric consultant. I am sure that it is more important for the physician to be able to discuss individual cases with a psychiatrist than it is for the student to see the psychiatrist—unless the latter is an accepted part of a large medical set-up. There are some conversion symptoms which should not be disturbed.

The college physician, in doing physical examinations, should guard his words and the expression of his face against suggesting that there may be physical lesions. When definite lesions exist there is of course no objection to telling the patient about them. It is the doubtful diagnosis which does damage.

While the doctor should keep in mind all the possible explanations of "The Wish to Fall Ill" I do not think that he should involve the patient in them. Especially is this true of Freudian interpretations. Avoid analytic terms: instead of saying "mother-fixation" speak if necessary of too much dependence on the mother. Use no dream interpretations. Analysts and those opposed to analysts unite in saying that half-way analytic procedures are poor treatment. Do not tell a patient to express himself, loosen his inhibitions, and think that you are backed up by psycho-analytic experience. Treatment by analysis is too deep and too specialized for college use: for it the student must be referred back to his family, his family physician and consultants called in by them.

The college physician should learn to use the psychiatric interview simply and harmlessly, letting the patient talk fully and freely for an hour, offering few interruptions, but some understanding and encouragement. If the physician can show the patient that he is stating a personal variation of a universal problem it may be something that the patient very much needs.

A very general statement of the role of the autonomic apparatus sometimes relieves a student's dread of organic illness and makes it easier to face the fact that disturbed emotions have physical effects which are painful enough but temporary and often harmless.

There is value in examining, even superficially, the emotional overload which some students carry. Common-sense methods may remove enough of the load to let the student get along.

Do not be harsh with a patient who is in a panic to begin with. Use rather a light touch—let the student feel that you are near to help him rather than to help the college office. Never mind if the student seems to get out of an examination on a given day: let him gain an immediate advantage. The academic departments should see to it that he does not gain in the long run.

"The Wish to Fall Ill," because of its gradations, because in some of its aspects it is almost universal, offers a practical inlet into the study and treatment of the psychological meanings of illness. It offers a chance to help students to handle their emotional difficulties in a constructive way.

General Considerations Regarding Lesions of the Colon*

Claude F. Dixon, M.D.†
Rochester, Minn.

THE subject of colonic surgery is so vast that I shall limit myself in this paper to certain phases of it which I deem of interest to those of us who are engaged in the practice of general medicine. Lesions of the colon requiring surgical attention are quite rare when compared with some other intra-abdominal conditions of an organic nature. Nevertheless, malignant and inflammatory diseases of the large intestine are far more common than we supposed even a few years ago. This apparent increase can most likely be attributed to our ability to diagnose these conditions with a greater degree of accuracy than previously rather than to any actual increase in the number of people so afflicted.

Much credit is due the older contemporary physicians who, before the advent of recent improved diagnostic methods, were able to determine the site and nature of colonic lesions from the clinical history alone. The clinicians of today can by a properly conducted proctoscopic examination directly inspect the lower two feet of bowel, and by roentgenographic observation can in most instances determine the presence or absence of defects in the remaining portion of colon. There is no doubt in my mind that we can today make a much higher percentage of correct diagnoses in cases of colonic disease than ever before, but we must not lose sight of the fact that a carefully taken and vigilantly studied history is still of the greatest importance. A few years ago there was admitted to my service a patient whose complaint was attacks of cramplike pain in the left lower abdominal quadrant. He was accompanied by his family physician, a country doctor. Our examination included roentgenologic studies of the gastro-intestinal tract, and while they were not wholly satisfactory, we were led to the belief that no organic lesion of the colon existed. On the urgent request of the patient's physician, who had made no roentgenographic studies, an exploratory operation was carried out and it revealed the presence of a carcinoma in the lower part of the sigmoid. Suffice it to say that this illustrates the importance of the clinical history, and that when it does not coincide with the roentgenologic findings, further consideration must be given to the history.

The symptoms of malignant lesions of the colon depend to a considerable extent on the segment of bowel involved. Carcinoma of the cecum or of the right half of the colon, for example, rarely produces obstructive symptoms as a primary sign, whereas carcinoma of the left half of the colon may produce partial obstruction and marked constipation quite early. Anemia, however, is present in a higher percentage of cases of cancer of the right half of the colon and is usually absent in cases of malignancy in the left half of the colon unless extension or metastasis has occurred. A few months ago, there came under my observation, a physician, aged sixty-eight years, whose only complaint was weakness. He had marked pallor and profound secondary anemia in spite of treatment directed toward the anemia, and his condition had grown progressively worse. Repeated gastro-intestinal studies had been carried out elsewhere but had not revealed any abnormality. On roentgenologic examination of the colon we found a cecal tumor which at operation proved to be malignant. The presence, therefore, of so-called unexplained secondary anemia in persons of middle age or older should suggest the possibility of tumor in the right half of the colon.

The liquid nature of the content of the right half of the colon explains why obstruction is not an early sign of the presence of tumor. A lesion in the left half, or descending colon, benign or malignant, frequently produces a cramping distress because of slight narrowing of the lumen of the bowel. This is explained when it is recalled that the content of the left half of the colon is semi-solid. It is of interest, I think, to emphasize that constricting lesions of the descending portion of colon frequently produce another symptom which often leads to an incorrect diagnosis, and that is, pain in the right lower quadrant. A case in point is as follows: A man, aged thirty-four years, was admitted to my service because of rather persistent dull aching pain in the lower right abdominal quadrant. Appendectomy had been performed elsewhere, and the appendix was said to have been reddened and was thought to be the cause of the patient's complaint. The initial symptoms, however, persisted. At the time I saw the patient, I had an advantage over the previous surgeon in that I could readily state that the trouble was not due to appendicitis. During the course of the examination, roentgenographic study of the colon was carried out and it revealed a carcinoma in the mid-portion of the descending colon, producing partial obstruction. We have observed at The Mayo Clinic that more than 15 per cent of patients suffering from carcinoma of the left half of the colon and sigmoid have undergone appendectomy for relief of symptoms. Pain in the right lower abdominal quadrant in such cases is apparently produced by distention of the cecum.

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*Read before the meeting of the Sioux Valley Medical Association, Sioux Valley, Iowa, January 22, 1936.

†Division of Surgery, The Mayo Clinic.

A few years ago I explored the abdomen of a woman about fifty years of age because of tenderness and pain in the region of the appendix. This pain was of two days' duration and she had vomited twice since the attack began. She was afebrile and the leukocytes numbered 10,000 per cubic millimeter of blood. On opening the abdomen the appendix came readily into view. It appeared inflamed and was markedly enlarged; the same was true of the cecum and ascending colon. Palpation of the appendix revealed that its lumen was empty. On exploring further I found a napkin-ring carcinoma in the left half of the colon which was causing obstruction of rather marked degree. Appendicostomy was performed and, two weeks later, the diseased segment of colon was resected.

In similar cases an accurate preoperative diagnosis may be difficult or impossible; however, if at operation a condition such as that just described is found (a distended appendix with an empty lumen and distended right colon), search for a lesion causing partial or complete obstruction in a more distal portion of the colon should be made.

Many malignant lesions of the colon and rectum are not discovered until they have become irremovable. In some such instances the fault lies with the patient, because he failed to consult his physician; in many cases the period of possible curability has passed because a diagnosis of colitis was made. The term "colitis," as I understand it, is often applied in cases in which the chief complaint is frequent passage of mucus or mucus and blood by rectum. It cannot be emphasized too strongly that such symptoms are quite characteristic of carcinoma of the large intestine.

We are now able to determine the presence of small polypoid tumors of the intestine by the double contrast method of roentgenographic study. Weber has been able to identify a single polypus of the colon no larger than a navy bean. His method consists in preparing the patient by means of mild catharsis given on the evening preceding examination. On the morning of examination the lower portion of bowel is cleansed by enemas. The bowel is then gently filled with barium under fluoroscopic visualization. This having been done, the patient is allowed to expel the medium and then, by the use of a small bulb-syringe, the tip of which is inserted into the rectum, the colon is gradually distended with air. This contrast method brings to view quite readily the shadow of small tumors, such as polypi, that otherwise would have been invisible. We now attach considerable importance to the presence of colonic polypi because, apparently, about half of the malignant lesions of the colon and rectum originate from these small tumors. Occasionally multiple polypi are found in cases in which patients complain of "colitis" and incidentally have a distinct hereditary tendency. The treatment of polypi is surgical, and the method employed, whether local excision or segmental resection, depends on the number of polypi present and on their benignancy or malignancy.

Finally, I wish to dwell briefly on the subject of diverticulitis, which is the most common inflammatory condition in the large intestine. This condition is more frequent among men than women and usually produces symptoms of such a nature that it, in the majority of instances, can be differentiated from malignancy by the clinical history alone. Diverticulosis and diverticulitis are most common in the left half of the colon, although, rarely the entire bowel may be involved. The classical symptoms of inflamed diverticula (diverticulitis) are rather sudden cramp-like pains, usually in the left lower abdominal quadrant, marked constipation, localized tenderness accompanied frequently by rigidity, elevation of temperature, and an increase in the number of leukocytes. Bleeding from the bowel is rare. A common term for this condition is "left-sided appendicitis." If perforation of a diverticulum has occurred, a mass can be palpated readily. In the acute stage the condition is best managed by rest in bed, warm saline irrigations by rectum, hot abdominal stupes, a low-residue type of diet, and liberal doses of belladonna. Roentgenologic investigation of the bowel after the acute phase has subsided reveals a serrated, elongated narrowing of the bowel, and usually diverticula which are not involved in the acute process can be seen distal or proximal to the region of constriction. The treatment of diverticulitis, at least in the acute stage, is for the most part medical rather than surgical. Surgical intervention may be required if there are frequent exacerbations or if too marked obstruction is present. Occasionally, three or four times a year we see cases of diverticulitis in which some of the diverticula have perforated into the urinary bladder. In such instances surgical intervention is obviously indicated.

Summary and Conclusions

Anemia is a common symptom of malignant lesions of the right half of the colon, whereas partial obstruction and passage of blood by rectum are signs which should cause one to suspect the presence of malignancy in the left half of the colon. In all cases, including those of so-called "colitis," malignancy should be ruled out.

Polypoid lesions of the large intestine are more commonly found than previously owing to improved methods of roentgenographic study. They should be considered as potentially malignant and should be removed.

Diverticulitis produces signs similar to those of acute appendicitis, except that the acute process usually takes place in the left lower abdominal quadrant. The majority of cases of diverticulitis can be managed by medical measures. When surgical treatment is necessary, it should be carried out during the quiescent stage. In most cases in which intervention is warranted frequent exacerbations have occurred or such complications as entero-vesical fistula are present.

Case of Prolapse of the Rectum Treated by Constricted Band

James K. Anderson, M.D., F.A.C.S.
V. G. Borland, M.D.
Minneapolis

THIS case is reported to call attention to a method first described by Mont. R. Reid, as one available for irreducible prolapse when surgical intervention is impossible, or contraindicated.

Male, aged forty-six, admitted to the Fracture Service of the Minneapolis General Hospital, on December 6, 1935, with a diagnosis of fracture of the Surgical neck of the right humerus. The patient gave a history of chronic alcoholism. On the second Hospital day, he developed symptoms of delirium tremens, and was transferred to the Nervous and Mental Ward.

On the seventh Hospital day, a prolapse of the rectum was discovered which was replaced manually several times by members of the Nervous and Mental Staff. A Proctologic consultation was requested on the eighth day and examination revealed 7 cm. of rectum protruding from the anus. This was greatly discolored, somewhat edematous and hemorrhagic, and there was some bleeding. Because of the poor condition of the patient, it was thought that surgery was inadvisable. It was impossible to keep the protrusion within the anus. A rectal tube was inserted into the rectum and constricting rubber bands were placed tightly about the neck of the prolapse, as near the anal orifice as possible. This produced additional pain for approximately two hours after application, after which time little complaint arose. During the next ten to fourteen days, it was necessary to replace the rectal tube on several occasions, following liquid stools, and it was necessary to apply the constricting bands on one occasion. On the fifteenth day almost all of the prolapsed portion had sloughed off. Several oozing points were cauterized and the rectal tube was withdrawn. In the next five days the region regained its normal color, the stools became more solid and the patient offered no complaints referable to the rectum.

Examination at the time of discharge, revealed a good functional result.

It has been impossible to further observe this patient as he was transferred to another institution.

REFERENCE

A Method of Treating Irreducible Prolapse of the Rectum. Mont. R. Reid, M.D., American Journal of Surgery, Vol. 20. p-359.

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MONTANA MEETING

Serving as the official journal of the medical society of the state of Montana, we are pleased to call to the attention of all members the annual meeting to be held at Billings, July 8 and 9.

Sometimes getting away to a medical meeting is like learning to swim, you have to be pushed a bit. When you find that the water is fine and the after effects are exhilarating you are glad. Please don't mind then if we try to promote that delightful sensation for you by a little push. If you want to meet your colleagues, exchange views and experiences, pick up something new, relax and have a little fun, you will arrange to be there.

Individuals may sit and ponder by themselves or study alone but they need to meet others now and then who have similar problems and who have consecrated their lives to the same cause and the same ideals, meet them in the flesh and talk things over. That's what medical meetings afford those who attend. Solitude and isolation have their peculiar advantages but it is necessary to get away from the daily monotony to experience the stimulating encouragement of masses of the same kind. Your own kind will be in Billings on July 8 and 9, in a big way and they'll be looking for you. A. E. H.

LIABILITY INSURANCE

ONE THOUSAND DOLLARS A WORD seems like very expensive diction, but such was the price spent by an insurance company for a few words dropped inadvertently by a certain physician in a certain town recently. The doctor, who spoke these words carelessly in the course of a conversation at a little social gathering, had meant neither to deprecate the work of his confrere nor to incite the ambition of the patient, but the fact remains that these few words were picked up and used as evidence in this suit.

During the present financial crisis, this sort of experience has been repeated in a good many places in the United States and, not only has it been a costly business to the liability company, but it has naturally been reflected in the increased cost of this type of insurance to the individual physician.

This should carry a lesson to all of us to be more guarded than ever in what we say to the patient or his friends. Liability suits are like scarlet-fever, very contagious, and an epidemic of this malady proves to be very costly, so much so that in certain localities the liability companies have withdrawn their services. This is a very serious condition, indeed, particularly in the western states where the number of physicians is not great enough to carry their own risks through co-operative effort.

The moral of this little story would be:

(1) Extreme care in offering casual opinions, particularly in injury and operative cases.

(2) Avoid testifying in courts either against your enemy or for your friend. L. H. F.

CUP BEARERS TO THE GODS

An excellent feature of the American Mercury's book reviews is that helpful notation generally is made whether or not the books reviewed contain an index. Were one to turn to any recently printed and indexed History of Medicine one might read as follows: "General Practitioner; now an almost extinct species; classified under Dodo." We delete from Maryland's annual programme for this year the following description of one of the papers set for said session, with the quoted abstract of the paper as sifted by the Maryland essayist. The italicized portion is that which suggested the title to this contribution:

"I. *The General Practitioner and the future.*

Abstract. Will the specialist drive out the family doctor, or will the latter become a mere traffic officer who will be directing the stream of human sufferers into sundry lanes leading to the specialist's door? As family adviser he holds a key position that no group, no specialist and no clinic can ever have—with the intimate knowledge of a patient's background which is possessed by him. He has lost ground, not so much by lack of intelligence, as because of the handicap of the lack of time. This is caused in most instances by his going to the patient, whereas the patient goes to the specialist, leaving him opportunity to be methodical in his efforts to leave nothing undone in order to reach a diagnosis.

Let the general practitioner not forget that he is the first to whom the sick must look for help, and let him do what he can to stem the tide of the great rush of the unethical and the incompetent into the fields of specialism. To set himself such a task means sacrifice, it means exercise of good judgment and sound application of knowledge; it also means patience."

A. W. S.

UNFAIR TO DOCTORS

One of the prominent developments of modern business is that division of what Henry Ford has called the "debt racket" known as "installment selling." It now has a new name "the budget plan." Those great exponents of truth in advertising, General Motors, General Electric tell you that their carrying charge is only six per cent when any school boy can figure it is actually 12 per cent. At the present time you can buy almost anything on the so-called budget plan. It is unfortunate that the physician cannot convert the vaudeville quip of "one more payment and the baby is ours" into a reality.

What does this installment racket mean to doctors? It works a hardship upon doctors and all others who serve the patrons of these deferred payment rackets. It should be plain that if farmer Jones must pay monthly installments on his car, tractor, radio, ice box, daughter's fur coat and son's new suit there is not going to be much left from his hog check for his doctor. It is the same with the city man's pay envelope. When all others are served, the doctor's time will come. We should not and do not ask a favored position although there is much argument for such an advantage. We are called to serve, and do serve in emergencies without regard to credit rating. It seems only fair that we should have an equal chance at the consumer's dollar.

When our enterprising business men went to France with their cars, sewing machines and installment selling, the intelligent French set up a commission to study the affect of installment selling on their people. They decided it was a bad thing. They considered that their Government would do better to aid in keeping their people out of debt than to encourage getting into debt. They took very prompt action. Conditional sales contracts have no legal standing in France and are unenforceable.

It may be argued that this would make it difficult for a young doctor or salesman to buy a car. There is nothing to prevent sales on time and if the buyer is honest and his business is such that the seller feels that he can pay, such sales will be made. It will simply restore to value a reputation for honesty, competence and good faith.

It seems to me that some attention to the economic effect of this modern trade practice upon our incomes and upon the welfare of our people might well find a place in our discussions of Medical Economics. Installment sales create no new business. They make less business because they raise prices. They simply lessen the commercial value of honesty and efficiency. Many groups are injured and none helped by the so-called budget plan. It would seem to me to be an intelligent thing for physicians to seek out the assistance of other injured groups and ask for fair play and an even break in the race for the customer's dollar.

A. S. R.

MR. SOULE AND THE TUBERCULIN TEST

In the Minneapolis Journal of December 28, 1935, and January 6, 1936, were letters on the tuberculin test bearing the name of H. E. Soule of Minneapolis. The JOURNAL-LANCET has no criticism whatsoever of the Minneapolis Journal or any other great daily newspaper publishing such letters. However, the readers of such columns are often unable to determine whether opinions expressed are based upon actual facts or are worthy of consideration. In the case of Mr. Soule's letters, it is not entirely clear to even members of the medical profession whether his statements are due to lack of knowledge of the subject of tuberculin testing or whether they are misleading propaganda. When one reads the above mentioned letters signed by Mr. Soule, however, there is some evidence to lead one to believe that he is intending to mislead the public. This is especially suggested in statements and quotations he has selected to make his point for he gives nothing of his explanations which precede or follow the statements or quotations. He reminds one of the person who stated that he could prove from the Bible that everyone should commit suicide. To prove his statement, he gave the following quotations: "And he went and hanged himself." "Go Thou and do likewise." He entirely omitted all the passages of the Bible that intervened between these two statements.

In the Minneapolis Journal letter of December 28, 1935, signed by Mr. Soule, some statements were made about the survey of employees of the Minneapolis schools. He calls attention to 2,190 who submitted to the tuberculin test, of whom 1,078 reacted positively. He then goes on to state that when these positive reactors had X-ray films made of their chests, as well as other phases of examination, it was found that not one of them "had to be let out of our schools because of tuberculosis." If Mr. Soule had had any intention of presenting a clear picture of the situation, most certainly he would not have omitted the fact that in the report of this survey published in the Journal of the American Medical Association, May 25, 1935, tables were presented to show that many teachers had shadows demonstrable on the X-ray film, which were used as a lead in making careful clinical and laboratory examinations to determine whether they were due to tuberculosis and if so, whether it was in a communicable form. Moreover, he would have quoted that section of the report which clearly stated that six of the employees had been found to have tubercle bacilli in their sputa. Instead of stating that no one "had to be let out of our schools because of tuberculosis," he would have said that these persons were granted leaves of absence until it is safe for them and their associates to have them return to work.

Mr. Soule next presented the cost to the Board of Education of the tuberculin test and X-ray films, which he says amounted to $6,598.70. He neglected to point out that an alternative was offered. Those who did not wish a tuberculin test could have an X-ray film examination. Since 1,112 reacted negatively and did not need X-ray films, the Board of Education was saved $2,780. Mr. Soule also neglected to state that after the Board of Education passed the order requiring adequate examination for tuberculosis, he appeared at a subsequent meeting and attempted to have it changed.

He next goes on to point out that had this program been extended to the school children of Minneapolis, it would have cost the Board of Education approximately $150,000. One wonders whether Mr. Soule knows that it is now costing Hennepin County, of which Minneapolis pays 93 per cent of the tax, many hundred thousand dollars annually to care for tuberculous patients, who could have had their disease detected by just such a tuberculin survey and other phases of the examination, including X-ray films, long before such drastic and prolonged treatment was necessary and before they had spread their tubercle bacilli about the community, thus, making certain a future tuberculosis harvest. Moreover, the county has expended well nigh $3,000,000 to build and equip an institution for the housing of such patients.

Mr. Soule did not tell his readers that the same tuberculin that is used in the testing of human beings has made it possible to completely eradicate tuberculosis from the cattle herds of whole counties in the United States and has brought about an accreditation of thirty-three states and the District of Columbia and large numbers of counties in the remaining states. Mr. Soule did not mention the fact that the majority of the colleges and universities of the land and many public school systems, as well as parochial schools, have accepted tuberculin testing as a standard procedure to be used periodically. He did not state that the tuberculin test is being used to eradicate tuberculosis from the human family in whole counties and districts in this country, such as Lorain County, Ohio, Linn County, Iowa, Cattaraugus County, New York, and districts of Alabama and Tennessee. He also failed to cite the recent action of the French army, which will probably lead to the immediate tuberculin testing of the entire army, as the first step in the detection of tuberculosis among the soldiers, in order to prevent the spread of the disease to the non-tuberculous.

A recent incident in the city of Minneapolis established " a new high in brass." It was widely announced that the Minnesota Public Health Association would hold its annual banquet in the ballroom of a hotel. The general public was invited and Mr. Soule appeared early. Before the more than four hundred guests were seated, it was observed that the waitresses were distributing to the tables, a four-page folder entitled, "Facts Regarding Mantoux Skin Tests for Tuberculosis," bearing the address of The Health

Bureau, 341 Loeb Arcade, Minneapolis, where Mr. Soule holds forth. The pamphlet contained an attack upon the tuberculin test and apparently the object was to have all of the guests read this pamphlet before the speakers of the evening, Drs. C. H. Mayo and Morris Fishbein, presented their addresses on tuberculosis.

In neither the above mentioned pamphlet nor the letter bearing Mr. Soule's name is it stated whether he has ever administered a tuberculin test, whether he is qualified or licensed to do so, or whether he has had a medical school education.

J. A. M.

SOCIETIES

FIFTY-EIGHTH ANNUAL MEETING of the MEDICAL ASSOCIATION OF MONTANA

Billings, July 8 and 9, 1936

COMMERCIAL CLUB

July 6 and 7, the annual meeting of the Montona Health Association.

July 7, the annual meeting of the Montana Academy of Oto-Ophthalmology.

July 7, at 2 P. M., meeting of the House of Delegates.

July 8, at 6:30, the banquet.

July 8th, 8:30 A. M.

Address of Welcome—J. I. Wernham, Billings, president of the Yellowstone Valley Medical Society.

Response for the Association—H. J. McGregor, Great Falls, vice-president of the Medical Association of Montana.

Report of the Secretary-Treasurer—E. G. Balsam, Billings.

Address of the President—L. H. Fligman, Helena.

"Fractures"—R. C. Webb, Minneapolis.

"Treatment of Anemia"—W. A. O'Brien, Minneapolis.

"Newer Methods of Diagnosis and Treatment of Pneumonia"—A. J. Lanza, New York City.

"Highlights in Routine Gastric Examinations"—E. D. Hitchcock, Great Falls.

"Is There a Period of Absolute Sterility in Women?"—Henry Schmitz, Chicago.

"The Indications for Caesarian Section"—L. M. Randall, Rochester, Minn.

"Montana's Pioneer Physician"—E. S. Murphy, Missoula.

"Subphrenic Abscess"—A. J. Movius, Billings.

"Manifestations of Allergy in General Practice"—A. R. Foss, Missoula.

"Indications for Radiation Therapy"—W. A. O'Brien, Minneapolis.

"Report on the Treatment of Pelvic Carcinomas with 800 K. V. After Thirty Months"—Henry Schmitz, Chicago.

Business Session. Election.

E. G. Balsam, M.D.,
Secretary.

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting Held March 12, 1936

President Dr. Floyd Grave in the Chair

TREATMENT OF ARTHRITIS

(Abridged)

Moses Barron, M.D.

Arthritis is a disease of great importance. Although its mortality is slight its morbidity is very great. It is one of the oldest diseases of which there is record. Evidences can be found in specimens in archeological museums dating back thousands of years, and specimens in the American Museum of Natural History in New York show definite arthritis in the vertebrae of animals that lived millions of years ago. Disability caused by arthritis is twice as great as that of its next competitor, heart disease.

By arthritis we mean a combination of changes both of the joints and the fibrous tissues. If we eliminate the specific types of arthritis, we deal with two types, hypertrophic or degenerative type, and the atrophic or infectious or proliferative type. In the latter there is undoubtedly an infectious agent, the exact virus is not yet definitely established. Acute rheumatic fever is excluded. This may produce recurrences but never leaves permanent deforming changes in the joints. This is why we disagree with Drs. Clawson and Wetherby, who seem to group rheumatic fever along with the chronic arthritis. In contrast to the acute rheumatic fever the atrophic or hypertrophic arthritis never produces changes in the heart. Foci of infection are common in atrophic arthritis. These are found in the teeth, throat and nose, and occasionally the genito-urinary tract. Teeth and tonsils must, therefore, be carefully examined.

Climate seems to be important. In southern Arizona there is practically no arthritis. Diet seems to be of little importance other than that it should be well balanced with plenty of fruits and vegetables. It is questionable whether bacteria are associated with the hypertrophic arthritis. The removal of foci is, therefore, of little importance in this type. The germs most commonly associated with the atrophic type are the streptococcus viridans, the non-hemolytic streptococcus and the hemolytic. Allergy perhaps also plays a part. The importance of trauma has been mentioned, especially in the degenerative type.

Chronic arthritics have a low sugar tolerance, giving almost a diabetic sugar curve. It is difficult to explain this finding. It may be due to the slowing of the circulation in the extremities. The chronic infection may also counteract the efficiency of the insulin.

Nothing has yet been found in treatment about which we should become too enthusiastic. The time element is a very important factor. Definitely established foci of infection should be cleared up whenever possible. Infected teeth, tonsils, nasal obstructions which may produce sinusitis, must all be considered. Obese patients should be reduced to decrease the effect of trauma. In the atrophic type the patients are generally undernourished. They should be built up to increase the resistance.

The great importance of trauma is illustrated by the Charcot joint which is simply a hypertrophic arthritis in which the pain and deeper joint sense is absent because of the syphilitic involvement. The patient traumatizes the joints unnecessarily because of the lack of danger signal, the pain. Rest is, therefore, very important in the treatment. Fatigue should be eliminated.

The circulation is improved through proper rest and complete relaxation. The bowels should be kept regular, but the colon irrigations are of very questionable value. Heat is important, both dry and moist, as it helps to dilate the capillaries and improve the circulation of the part. As yet it is very doubtful whether the new type of heating chamber will be of any value in the treatment of chronic arthritis.

Vaccines are being used considerably at the present time. These are given subcutaneously and intravenously. I doubt very much the efficiency of the subcutaneous vaccine. Dr. Clawson feels that the intravenous method helps to desensitize the individual. Dr. Wetherby seems to feel that the streptococcus vaccine is a sort of specific method of treatment. Many observers feel that any efficacy which it possesses is nonspecific in type. I have found much more favorable results from the use of triple typhoid vaccine intravenously to produce fever and certain other immune reactions. The procedure is simple. I generally give 25 million for the first injection and increase by 25 or 50 million at each injection at intervals of about three days. The fever rises up to about 103 degrees. I increase until I give a thousand million at an injection. This nonspecific therapy is a sort of shock-therapy which probably helps to liberate anti-bodies from the tissue cells. Physicochemical changes seem to occur in the liver during this treatment.

Massage is very important. In chronic cases it should be started early. It helps to improve the circulation and prevents development of atrophy of the muscles. Many institutions report good results from their treatments because they have well-trained people giving massage. Active and passive exercise is also important.

Diet seems to be emphasized by many but its importance is overestimated. A properly balanced diet will do as much as any specific diet, unless it be to reduce an obese patient or help build up an undernourished one. Such diets generally have enough vitamins. Drug therapy is very unsatisfactory except for the relief of pain and discomfort. In patients with low metabolic rate thyroid extract may be used, grain one or two daily. The value of iodine is very questionable. Nux vomica may be used to increase the appetite.

In review, in hypertrophic arthritis obesity should be treated, foci of infection are of little importance. In the atrophic arthritis the patient's condition should be built up and foci of infection eliminated. The vaccine treatment is of value as a nonspecific agent to be given intravenously to produce fever. Sunlight and climatic conditions seem to be important. Drugs are of very little value except for the relief of pain. Arthritis is a disease which belongs to the general field of internal medicine. It is not a disease for the orthopedist alone nor for the eye, ear, nose and throat man alone.

Discussion of Dr. Barron's Paper

Dr. E. T. Evans: With all due respect to the medical profession, I want to tell Dr. Barron that we see the end results. After all, whether we be orthopaedists, surgeons, medical men, specialists, if you wish, we must have some fundamental knowledge of the various subjects which are treated and I will start right out by saying that from the orthopaedic standpoint the treatment of arthritis is the prevention of deformity. Any of you who treat arthritis, remember that. If you do not prevent deformity, the orthopaedist will get the case and maybe we can correct it.

We think we know a little about the medical problems of this disease. Acute rheumatic fever is a disease entity in itself but if the present idea of arthritis is right, in that it is a result of sensitization to a streptococcus, why can't an attack of acute rheumatic fever sensitize the patient? It means that when the streptococcus reinfects that patient he is already sensitive and he may get arthritis and I do think the history of the acute rheumatic fever is an important factor, not as a causative agent, but as a sensitizing agent.

With reference to sensitivity to chills and its effect in the causation of arthritis, may not chilling be rather an indication that this individual is sensitive to the toxins found? We find in numerous cases of spinal anaesthesias on atrophic arthritis cases that there is a definite vasomotor spasm present. It is not involvement of the vessels themselves but it is a vasomotor effect. With reference to this same factor, the question of vasomotor effects and the question that Dr. Barron brought up regarding circulatory spasm. As a matter of fact, from an experimental standpoint, sympathectomy, which has been used, does result in improvement in the subjective complaints of the patient with arthritis but sympathectomy increases bone atrophy. On the other hand, vasomotor spasm may be present in these cases and bone atrophy is also present, so whether or not it is a general circulatory effect or a local circulatory effect is of great question. Personally, we think bone atrophy in these cases is a local circulatory effect rather than a general circulatory effect.

With reference to the use of heat chambers, they are not, strange as it may seem, enthusiastic about them at Rochester. In gonorrheal arthritis, yes, that is one specific instance in which these heat chambers produce some effect. The arthritis patient we put into a heat chamber comes out of it and feels better for awhile, then back to his original status.

With reference to trauma and using Charcot joints as an example, I wonder how Dr. Barron would explain Charcot joints, bilateral of the knees with deep pain sensibility intact. It seems to me from an X-ray standpoint alone that the changes are in the bone itself, that is, the increased density which we find in the epiphysis and at the joint area. On the other hand, these broken off spiculae of bone must be explained on a neurogenic, not traumatic basis.

With respect to the question of vasomotor changes in arthritis, it is true that there are changes in the blood supply. It may be that these, as I mentioned above, are purely local.

With reference to typhoid therapy, we feel it, together with rest and judicious physiotherapy, is of definite help in a fair percentage of cases.

In our sub-acute flare-ups now, and with our painful cases, we get the best results where we use typhoid with rest, and physiotherapy, very mild physiotherapy, with rest, massage, lamps, etc.

I have two questions to ask Dr. Barron: 1. Why is it that the medical man will take his case of arthritis and carry him to the point where it is chronic and develops ankylosis, and then continue to treat him medically without using competent orthopaedic advice to break up those adhesions and restore the function of the joint after it has become quiescent? 2. If physiotherapy is justified, I want to know why they depend upon the qualified physiotherapist who has no surgical judgment, instead of the orthopaedist? And I know many physiotherapists who agree with me. I was down to their meeting just the other day, Dr. Henderson gave a paper on the manipulative treatment of joints in arthritis. It behooves every surgeon to read it.

Just let me give one warning on the use of vaccine. I have seen four cases of tuberculosis in the last year in which a clinical examination was made and the condition appeared to be arthritis. They used vaccine and just "blew them up." Do not forget that tuberculosis may be a factor and active treatment along the vaccine line is definitely contraindicated.

Dr. Leo Rigler: I just want to call attention to the fact that at the meeting of the American Society for he Control of Rheumatism there was a discussion on the use of the heat chamber and what I gathered was that only in gonorrheal arthritis was the heat chamber very effective.

I want to ask Dr. Barron about the use of vitamin C therapy in arthritis. A great deal has been said about its results. I wish to inquire also in reference to the use of gold salts, especially in the ankylosing types of arthritis in the earlier stages. It is claimed by Forestier particularly, that in ankylosing spondylitis where they have been able to get the patient before any great deal of ankylosis had occurred, the gold therapy will stop the progress of the disease, relieve the pain and prevent ankylosis from occurring.

Dr. Willard White: In some of the publications recently, particularly the *Journal of Bone and Joint Surgery*, there have been a number of men who have reported on the use of colloidal sulphur, particularly sulphur diasparol. Some of the men who have done some accurate work speak very favorably of the use of this substance.

Dr. Moses Barron: I have seen several papers dealing with the colloidal sulphur treatment of arthritis. It seems to me the use has been rather limited. I have also seen articles dealing with vitamin C in large doses as of value. I have not been very much impressed with these results as reported. I do not believe that anything definite has been proved in regard to the use of colloidal gold and histamine. The latter is supposed to be effective through the dilation of the capillaries. It is because some favorable results are being reported with such a variety of methods of treatment that one has to be very careful in drawing conclusions from any method of treatment of a condition which is so difficult to manage.

The criticism Dr. Evans has made is well taken. I do believe that we do not use physiotherapy sufficiently and properly in the chronic cases of arthritis. This undoubtedly could be done best under the supervision of those who make a specialty of joint diseases. Dr. Evans did not agree with me in bringing in Charcot's joint in illustrating the importance of trauma in hypertrophic arthritis, yet he himself has mentioned the importance of obesity which he stated meant increased trauma to the joints. In the syphilitic the pain sense being diminished or absent, the patient does not protect himself from traumatizing the injured joint. This results in the great destruction and helps to bring about the flail-joint. The nonsyphilitic patient protects himself from the severe trauma because of the pain. There is undoubtedly some metabolic disturbance in hypertrophic arthritis.

TREATMENT OF ARTHRITIS

Discussion by Dr. T. A. Peppard

(Presented Before the Minneapolis Clinical Club)

Cecil has remarked that the treatment of chronic arthritis seems to be largely geographical. In the Southwest it is chiefly sunlight, climate and baths; in Philadelphia a low carbohydrate diet; in Toronto, colon treatment and the use of vitamins; in Boston it is orthopedic treatment; in New York it is the consideration of the streptococcus as the cause of the condition and the use of streptococcus vaccines; in Rochester, New York, it is hyperthermia; in Rochester, Minnesota, it is sympathectomy. He says, furthermore, that it seems that in the various localities too much attention is paid to one or two methods of treatment to the exclusion of others.

It occurred to me that it might be of some interest to learn the sentiment of the Minneapolis physicians, and this being the season for straw votes and questionnaires, I sent out questionnaires to twenty-eight internists asking that they specify, insofar as possible, designating in order 1, 2, 3, 4, and 5, the method of treatment sued in chronic arthritis, which they held in most esteem. I fully appreciate the difficulties attendant upon any such plan but I thought it might show the trend of ideas here in Minneapolis. I was highly gratified by a practically universal response. Two state that they could not designate numerically their choices, but twenty-six did do this and from their answers I have prepared the chart shown on the slide. The first listed is psychotherapy. I put this in for the especial benefit of one particular man and sure enough his questionnaire came back with such therapy listed as number one. One other individual stated that it was to be used in all cases. Not at all surprising is that rest comes very high in the list. Nine specified rest as their first choice, three each in second and third places, four in fourth place and one in fifth. I was mildly surprised and greatly interested to find eleven men specifying removal of foci of infection as their first choice; one placed it second and three each in third, fourth and fifth places. The methods of physical therapy occupied the next prominent place, none rated it in first place; seven indicated it was second and three each in third and fourth places and five in fifth place. If, however, we include the special listing of hydrotherapy, heliotherapy and hyperthermia we find that the methods of physical therapy are mentioned most often. Three men signify hydrotherapy in their list of five; three heliotherapy and four hyperthermia. The next most popular method was the use of drugs. These do not appear in first place in any instance; three indicate drugs as second, four as third, six as fourth and two as fifth. I asked on the questionnaire if they would specify any particular drug of choice and listed here as you see are salicylates (in some instances it was designated that this would only, of course, be for relief of pain), iodides, thyroid extract, histimine, chaulmoogra oil, cod liver oil and oxoate B (calcium ortho-iodoxybenzoate). Next are foreign proteins, one man placing it first, two second, one third, and four each fourth and fifth. Climate is designated by several, none rating it first in any instance, one rated it second and three each third and fourth and fifth. Diet is rated first by one; two place it second, three third, one fourth and two fifth. I might say that most stated that in their opinion it was merely a matter of nutrition, those undernourished patients requiring building up, and those overweight patients who required weight reduction. Only four mentioned specifically vitamins and none signified that they paid any particular attention to low carbohydrate diet. Then, vaccine; here we find one man placing it in first place, one in second, two in third and four in fifth. Several of these signified that the use of vaccine was merely in a nonspecific sense. Intestinal hygiene occupied an unimportant place. I might call attention to the next to the last subdivision, orthopedic treatment; either the internists in Minneapolis have not been trained in Boston or the orthopedic men here have not shown the internists just what can be done in the treatment of arthritis.

After looking over the chart I call your attention to the lower right hand corner. A little over a year ago Cecil sent out a similar questionnaire to sixteen men. He states that most of these were heads of departments of medicine in various institutions and men who had had ample experience in treating arthritis. It is of interest to note that the first three important measures in his group, namely rest, removal of foci of infection and physical therapy, are the same as the first three listed here.

It is, of course, apparent to all that it is not possible to designate specifically, 1, 2, 3, 4 and 5, the measures that are to be used in any particular case; sometimes we employ one plan, sometimes another, individualizing in every instance. Properly we can assume that, in Minneapolis, arthritis is treated just as well or just as poorly, as you wish, as anywhere else. When all is said and done arthritis is probably going to remain a bugbear to anyone who tries to treat it.

ROENTGENOLOGIC FINDINGS IN FUNCTIONAL DISTURBANCES OF THE COLON

Inaugural Thesis, Dr. Russell W. Morse

The object of this thesis is to present the roentgen findings produced by the normal motor phenomena of the colon, and then to discuss the abnormal findings which allow one to postulate the presence of a disturbance of motor function. In this discussion no attempt will be made to differentiate the reflex changes in function produced by organic pathology outside of the colon from the changes in function produced by faulty neurogenic control. Motor function deals not only with the propulsive phenomenon, but also with the function of the muscle tone and segmentation of the lumen.

Roentgen study of the function of the colon is made by observing the behavior of the colon during the passage of a barium meal and the behavior during and after a barium enema. The barium meal is directly comparable to the usual fecal contents of the colon. The barium enema may rightfully be considered an unnatural procedure, yet the behavior of the colon during its injection and during its presence, and the degree to which it is evacuated by the colon, affords very valuable data as to the state of the musculature. For the study of the muscle function there should be no preparatory emptying of the colon by the use of enemata or purges. The first may destroy the findings one should bring out by the barium enema, and the second, by the very nature of its action, produces an abnormal state of tonus and contraction of the musculature.

In routine use the barium enema is best given at the examination twenty-four to forty-eight hours after ingestion of the barium meal. To obscure the confusing shadow produced by remnants of the barium meal in the colon, sufficient barium must be used in the enema suspension to make it more dense than the other barium remnants. With this method the marginal outline of the lumen of the colon may be irregular due to the presence in the colon of food remnants. When this happens, one may be unable to rule out organic pathology, and it will be necessary to repeat the barium enema examination after the colon has been thoroughly cleansed by catharsis.

Passage of the Barium Meal

Following ingestion of an inert barium meal composed of barium sulphate and water, the stomach almost immediately begins to evacuate itself and the meal is propelled through the small intestine by broad waves of peristaltic contraction. Normally the head of the barium column reaches the terminal ileum and begins to enter the colon between two and four hours. The stomach is empty between two and two and one-half hours. As the patient has been fasting since the previous evening, food is allowed as soon as the stomach has evacuated the barium meal. Ingestion of this food accelerates the passage of the barium meal through the intestine and its distribution in the colon. At four hours the head of the barium column is normally at the hepatic flexure or in the proximal two-thirds of the transverse colon, the tail of the column being in the lower ileum. Between six and nine hours the head of the barium column is in the descending colon and all of the barium is in the colon. At twenty-four hours the head of the column is in the rectum or has been evacuated. At this time the cecum and most of the ascending colon are filled with food ingested after the barium meal and mixed with traces of the barium. At forty-eight hours and after one or two evacuations only traces of barium normally remain in the colon.

The Barium Enema

When the barium enema is administered twenty-four or forty-eight hours after ingestion of the barium meal or at other times without preparation of the colon by purges or cleansing enemata the following observations are normal: The barium suspension injected at a pressure of eighteen inches of water passes smoothly through the colon, distending it moderately until the entire colon is filled. Then, with injection of more of the fluid, the suspension passes through the ileo-cecal valve into the small intestine.

After the patient is allowed to evacuate this enema one finds that there is barium remaining in the terminal ileum, cecum, and ascending colon, but that practically all of the barium has been evacuated from the colon distal to the hepatic flexure.

The motor function of the colon, i.e., transportation of its contents from its proximal to its distal portions, retention and segmentation of its contents to facilitate dehydration and evacuation of its contents, at first consideration appears a simple phenomenon. Detailed study, however, reveals a complicated mechanism. Classified on the basis of function, the motor phenomenon of the colon may be divided into two mechanisms: First, the propulsive motor contractions, and secondly, the phenomenon of segmentation, or haustration. These are actually two separate mechanisms, readily dissociated. Closely intertwined with both phenomena is the state of tone of the musculature, and this deserves special consideration before discussing the others.

Muscle Tone

In common with other parts of the gastro-intestinal tract the muscle of the colon is always in a state of tonus, i.e., tonic contraction upon the contents of the colon or, when empty, upon the mucous membrane with obliteration of the lumen. This tonus is of such intensity that the lumen is readily distended to a moderate degree by low pressures of fifteen to twenty-five inches of water. In certain areas the muscle is more irritable and the threshold of stimulation lower than in the surrounding muscle. The response of these areas to stimulation is an active contraction with a pronounced tendency to a spread of the contraction, the formation of a peristaltic contraction which advances anal-wards. The normal stimulation which produces active contraction in these areas is distention of the lumen by fecal material. The experimental findings of Cannon show that any area of tonic contraction in the colon, whether occurring spontaneously or produced by local stimulation, may act as the origin of waves of contraction which pass distally or proximally from the area of tonic contraction. These areas of higher tonus are the "pacemakers" of Alvarez. In the normal colon such a pacemaker is present in the neighborhood of the hepatic flexure, its site varying individually from the proximal part of the ascending colon to the proximal third of the transverse colon. There is usually a second pacemaker in the upper part of the descending colon near the splenic flexure, and a third in the lower part of the sigmoid colon. These areas of higher tonus and greater irritability are the segments which initiate the propulsive contractions of the colon.

Filling of the Proximal Colon

The cecum and proximal part of the colon are filled passively by the propulsive force of the peristaltic contractions of the terminal ileum. This propulsion is resisted by the state of tonus of the muscle of the proximal colon. As the chyme is slowly passed through the ileo-cecal valve there is gradual distention of this part of the colon and the head of the column advances to the hepatic flexure and into the proximal part of the transverse colon. There is a lack of active propulsion on the part of the proximal part of the colon. There is also no demonstrable reverse peristalsis as has been claimed by some observers. Due to the passive role played by this part of the colon it is not unusual to find all of the barium meal situated between the cecum and hepatic flexure. In this way the proximal colon fulfills its function of facilitating dehydration of its fluid contents.

Propulsion of Fecal Contents

When sufficient distention of the region of the proximal pacemaker has occurred, a propulsive contraction wave is initiated which advances through the colon the material that has accumulated distal to the pacemaker. The contraction wave which arises at the proximal pacemaker advances usually to the distal part of the transverse colon or the splenic flexure. Because of the bulk of colonic contents advanced by these contraction waves they were called "mass movements" by Holzknecht and Case and this appropriate name has remained. They occur very infrequently and, as they advance the barium meal, one may observe them only a few times during years of roentgenologic practice. They are often seen during distention of the colon with a barium enema.

When there is sufficient distention of the region of the splenic flexure a wave of contraction is initiated at the second pacemaker and a "mass movement" occurs through the descending colon, the fecal contents being moved to the sigmoid or into the rectum.

The phenomenon of this peristaltic contraction is interesting. This progressive peristalsis is a function of the circular layer of the muscularis propria. The active segment of contraction is two to three centimeters in length. The contraction wave advances slowly, one-half to two centimeters per second. Ahead of the contraction wave the lumen may be markedly distended. Following the passage of the wave the colon remains tonically contracted upon its relatively empty lumen. The intensity of this tonic contraction is apparently quite great. This part of the lumen remains empty until it is gradually filled by pressure of the content proximal to it, or more rapidly filled by a mass movement of the contents of the bowel.

When a contraction wave empties the contents of the descending and sigmoid colon into the rectum, the residual tonic contraction of the sigmoid colon acts as a sphincteric barrier which maintains the contents in the distended rectum. This is called the rectosigmoid apparatus.

Evacuation of the Colon

This is accomplished by a propulsive contraction wave which may develop in the lower sigmoid in a region near the splenic flexure or even from the pacemaker near the hepatic flexure. The bulk of the material evacuated depends, first, upon the amount of fecal material that has accumulated since the last defecation, and secondly, upon the distance back in the colon in which propulsive contractions occur. There may be emptying merely of the rectum, emptying of the colon distal to the splenic flexure, or emptying of the entire colon distal to the middle of the ascending colon. Some fecal contents always remain in the cecum and ascending colon.

Segmentation of the Colonic Contents

The segmentation of the contents of the colon is a very striking and familiar finding in all roentgenologic studies of the colon whether with the barium meal or the enema. This division of the contents of the colon is the function of the segmental folds, which produce sacculation or haustration of the colon. The segmental folds have usually been considered as due to local contraction of a few of the fibers of the circular layer of the muscularis propria. When the haustra are separated by wide folds which nearly or completely bisect the lumen, the roentgenographic findings are compatible with this conception of the formation of the folds.

However, many folds are observed roentgenographically in which the sulci produced by the folds are too narrow to permit of a double layer of the muscularis propria inside of the fold of mucous membrane and submucosa. Post-operative specimens obtained by resection of the colon for tumor have been so prepared as to preserve the colon in a state of tonic contraction with the lumen distended as one sees it in the barium enema. These specimens show that in the colon, as in the stomach and small intestine, the mucosa is redundant when the muscularis propria is in a state of tonus. This redundant mucosa forms circular, spiral and semicircular folds which divide the lumen of the colon into pockets. The cut edges of these folds are the size and shape of many of the segmental folds observed in the roentgenograms. The muscularis propria does not enter into these folds. The presence of folds other than those which may be produced by circular contraction of the muscularis propria is shown also by the change produced in the folds when the colon is tightly contracted after passage of a peristaltic contraction. The markings of the folds are not obliterated but are shortened and widened. This is the change one would expect when mucosal folds are flattened by outside pressure from the contracted muscularis propria. Therefore, it is reasonable to assume that segmentation of the colonic contents may normally be produced by folds of the mucous membrane as a passive formation or by contraction of the muscularis mucosae, or that they may be produced by local contraction of the circular layer of the muscularis propria.

Several years ago we studied, by serial roentgenography, the movements that occur in these segmental folds. It was found that they do change slowly but were not propulsive. Individual folds would vary slowly in their depth and would disappear with the formation of a new fold in the immediate vicinity. Recently Barclay has studied these folds by roentgencinematography. His conclusions were similar to ours and as follows:

"A preliminary note is made on the movements of the haustra of the large intestine. These are slow, intermittent, and may be localized to individual haustra. They are not in the nature of propulsive peristaltic waves: They do not appear either to produce definite progression in the intestinal contents or to have directional intention. They seem to be concerned solely with the turning over of the intestinal contents and, one would imagine, with the mixing and dehydration process that tends to the uniform consistency of the stool."[1]

These findings indicate very clearly that these folds are under the control of some muscle, either the muscularis mucosae or the muscularis propria.

Segmental folds are numerous in the ascending and transverse colon, and relatively few in the descending colon. Those which are observed in the descending colon are broad in the longitudinal direction of the bowel and are quite characteristically due to contraction of the muscularis propria.

Redundancy of the Colon

The colon may be anatomically redundant in the sense that it is actually of greater length than is average. Such a redundant colon may have a normal fixation to the posterior abdominal wall and the excess length may take the form of abnormal fixed loops situated either at the flexures, in the middle of the descending colon, or in the sigmoid region.

Redundancy of the colon may, however, be apparent rather than real, and this apparent redundancy is due to the change in length which occurs with contraction and relaxation of the outer muscle coats. When the muscularis propria relaxes, as occurs with distention of the lumen with a barium enema, the length of the colon is increased. When the muscularis propria contracts, the length of the colon is diminished, as is shown after evacuation of a barium enema.

Disturbance in function of the motor phenomena of the colon will express itself objectively in a distortion of these normal findings. Tone, broadly defined, is the general condition of the body with reference to the vigorous and healthy discharge of its functions. Disturbance of function will consist, therefore, either of a hyperfunction (hypertonicity) or a hypofunction (hypotonicity or atony). A variation in function in the musculature of any part of the gastro-intestinal tract is rarely a strict hyperfunction or hypofunction. The two states are often mixed and there may be, in any particular function, a rapid or gradual change from hypertonicity to hypotonicity. At times the change is so rapid that it is clonic in nature.

Abnormalities of general tone can be measured in several ways. By the use of the barium enema it is measured by the resistance of the colon to distention and by the calibre of the lumen under the low average pressure of eighteen inches of elevation of the enema container. When the colon is hypertonic the advancing head of the barium column moves slowly and its head is blunt as it gradually distends the collapsed bowel. After distention at this pressure the calibre of the lumen is smaller than is normal. When the colon is hypotonic the head of the barium column advances rapidly and is irregular as it passes around the retained fecal contents and the segmental mucosal folds. Alternations between hypertonicity and hypotonicity are most frequently and best observed in the descending colon. As the colon is filled the descending colon will alternately show a small and large lumen, the relaxed phase gradually becoming more constant and finally becoming predominant. With the barium meal the general tone is measured by the bulk of the contents that are present in its various divisions.

Abnormalities in tone may be diffuse throughout the colon or may be limited to one or more anatomic divisions of the colon. True atony results in the marked dilatation of the colon observed in Hirschsprung's disease.

Peristaltic type of spasm: This is an exaggeration of the peristaltic contraction producing mass movement of the feces. The exaggeration is both an increase in frequency of the contraction, and an acceleration of its rate of progress. The site of origin is apparently in the first and second pacemakers of the colon near the hepatic and splenic flexures. Logically one must consider that this is basically a hyperirritability of the pacemakers. The barium meal is distributed through the colon rapidly, the head of the column often being in the sigmoid or rectum within two hours after ingestion of the meal. The meal is also rapidly evacuated, sometimes completely so at the twenty-four hour examination.

Hypertonic Types of Spasm: Under this heading one may group several different abnormal contractions which are fundamentally similar. In three individuals we have observed in the ascending colon, near the cecum, an area of tonic contraction approximately one and five-tenths centimeters in length. This contraction was permanent in the sense that it persisted throughout the examination and could not be relaxed by massage or distention with the barium enema. Frequently during the examination a peristaltic contraction would arise from the tonic contraction and would pass distally evacuating the colon. Because of these characteristics we have applied to this type of contraction the term "abnormal pacemaker." This finding fulfills the description of the "ceco-colic sphincteric tract" of Hirsch, with the exception that we have never seen reverse peristaltic contractions arise from these tonic contractions. The appearance which they give in the roentgenograms is similar to a small annular carcinoma, except for the presence of normal longitudinal mucosal markings within the contracted area.

Closely related to the "abnormal pacemakers" but more common in occurrence are the local areas of temporary tonic spasm one observes in the colon when it is distended with a barium enema. These are most frequently observed in the transverse and descending colon, but occur also in the ascending and sigmoid colon. They are transitory in that they come and go quite rapidly in different parts of the same colon. They may serve as the point of origin of a peristaltic contraction, and in our experience these contractions have progressed distally and have never been reversed. With the barium meal a similar type of tonic contraction is often present, but the area of contraction is more extensive, measuring several centimeters in length.

When the transverse and descending parts of the colon are markedly hypertonic, a common finding on distention with the barium enema is a clonic fibrillary type of contraction. These are apparent as numerous, narrow, rapidly changing sulci in the barium column. They are relatively shallow and simulate the appearance of low mucosal folds. Occasionally, one will persist and develop into a broad tonic contraction.

More difficult to evaluate is a tight tonic contraction which persists for a long period after passage of a peristaltic wave, particularly the peristaltic contraction which evacuates the descending and sigmoid colon. We have observed this contraction persisting for six hours after the evacuation and at the end of that time offering a marked resistance to relaxation by the distending force of the barium enema. It is our opinion that this is a phase of diffuse hypertonicity and an exaggeration of a normal function.

Segmental Fold Type of Spasm: From the study of many individuals one obtains a definite impression as to the average normal character, number, and distribution of the segmental folds dividing the lumen of the colon into haustra. In colons showing other characteristic findings of hypertonicity it is usual to find an increased depth of the segmental folds, and an increased number, so that they are numerous in the descending and sigmoid colon. The importance of the number and distribution of the haustrations is open to question, although the presence of numerous segmentations in the descending and sigmoid colon is an abnormal finding. Of greater significance is the depth and breadth of the segmental folds, particularly when they bisect the lumen of the bowel with a tight, obstructing contraction of the muscle.

A hypotonic state of the colon may have associated with it a supression of the propulsive peristalsis and a retention of the segmental fold contractions. The contents of the colon are bulky. The barium meal forms large separated masses which progress slowly through the colon. The barium enema passes freely into the colon around the retained fecal material and the calibre of the lumen is large. There are no active tonic or progressive contractions. Observation after evacuation shows retention of a large part of the enema, the only evacuative force apparently being a slight tonic resiliency of the muscle wall. In our opinion loss of the propulsive and evacuative function is more important in the production of constipation than is an exaggeration of the mechanism for dehydration.

Aside from constipation, the most common symptom of abnormal colon functon is abdominal distress. During roentgenologic study of the colon the distress experienced by the patient is a very important subjective finding; and, at times, is the only finding indicating disturbed function. This evidence is just as elusive as many of the objective findings. Unfortunately, it also depends upon an intangible factor, the level of pain perception, which varies markedly between individuals, and at different times in the same individual. We do not understand, as yet, why the same objective phenomenon will on one occasion produce distress, and on another take place without producing any appreciable sensation. Discomfort elicited during the examination is particularly valuable when it duplicates the symptoms of which the patient complains.

Spontaneous cramp-like pains may be experienced by the patient when there is a peristaltic contraction during the administration of a barium enema. Mild or moderate discomfort is frequently the complaint when areas of tonic spasm are being relaxed by the pressure of the enema. This mild distress is often interpreted by the patient as the sensation of "gas" or "distention." This finding strengthens the impression we have had for some time that the sensation of "gas" in both stomach and bowel is not produced by the presence of gas or air, but by an abnormal muscle contraction or tonus. Less frequently the spontaneous distress is interpreted as a feeling of soreness.

Pain may be experienced subjectively by the patient when the bowel is palpated by the examiner. The degree of pain experienced, or complained of, may be very variable in intensity in different parts of the colon, and in the same region may vary greatly with different degrees of distention of the bowel. In some individuals the tonically contracted colon is very tender on pressure and this tenderness diminishes and may completely disappear as the colon is relaxed. In other individuals the contracted colon is not sensitive, but becomes painful on pressure when it is distended. We have no explanation for this paradox.

A colon may show generalized objective findings of dysfunction and yet subjectively exhibit spontaneous distress, or distress on palpation in only one division. This localization of distress simulates organic pathology of the appendix, gallbladder and the stomach. For this local manifestation of distress there is, so far, no logical explanation.

During the passage of the barium meal the following findings are indicative of a functional disturbance of the motor phenomena:

1. Increased rapidity of passage of the meal through the colon.

2. Delayed passage and evacuation of the meal—relative inactivity of the propulsive contractions.

3. Unusually numerous and bisecting segmental folds or contractions.

4. Irregular and very broad areas of tonic spasm segmenting the fecal contents of the colon.

These findings are the objective findings of the motor abnormalities which result in diarrhea, frequency, smallness and softness of the stool, and constipation.

Observations made during and after injection of a barium enema at low pressure, and observations made after attempted evacuation of the enema may show the following objective-subjective findings of muscle hypertonicity and hyperirritability, or muscle hypotonus. The muscle may show in a short period of time a reversal from increased tonus to decreased tonus.

1. Diffuse tonic contraction.

2. Localized tonic contractions.

Both may seriously resist the inflow of the barium and at least temporarily act as a complete obstruction.

3. Localized clonic contractions of the muscle. These may be fibrillary in type or a broader tonic spasm.

4. Localized tonic spasm which act as abnormal "pacemakers" and from which arise frequent peristaltic contractions.

5. Frequent peristaltic contractions attempting to evacuate the bowel, but in which the irritable pacemaker is not visible as a tonic spasm.

6. Abnormally large calibre of the lumen with increased length of one or more divisions of the colon.

7. Rapid passage through the colon of the suspension at low pressure. Six and seven are the result of hypotonicity or relative atony of the muscle.

8. Lack of satisfactory evacuation of the enema due to an absence of propulsive peristaltic contractions.

9. Subjective symptoms of pain and sensation of gas during the injection of the enema at low pressure. The pain and discomfort of a sensitive colon must be differentiated from the distress produced by over-distending the rectum.

The subjective symptom of pain on palpation of the colon may be elicited during the study of the barium meal or the barium enema.

Discussion

Dr. Leo Rigler: I can say very little about this subject and I hardly feel competent to discuss it. I take it from Dr. Morse's discussion that it is really talking about variations in the normal tone of the colon. The reason I say that is because we have heard so much about so-called spastic colon and what might be called nervous conditions of the colon. I think all the things that Dr. Morse shows us, which are very illuminating so far as the physiology of the colon is concerned, are effects of the various mental states on the colon; all of these things we observe, in a haphazard way, on patients somewhat irregularly. It is possible to get in any one patient the appearance of atonicity or hypertonicity when various states of the patient's nervous instability are present. Studying medical students, freshmen, sophomores and juniors at the Western Reserve Medical School, Todd used to do barium enema examinations of their colons. After they had examined a freshman in the fall when he was just beginning anatomy, and had this examination of the colon recorded with films, etc., the same group of students would be brought up again in the spring for re-examination. They would look up their colon films and study them before doing the examination again and Todd used to say that when they did the second examination they could always tell which student was flunking and which was getting by. I do not believe that this was meant literally, but what was meant was that the state of the colon often reflects the mental state of the individual. The colon seemed to reflect in its general atonicity and low state, the general low state of the individual.

These changes are certainly not constant changes in any individual. One can obtain them from time to time in certain individuals who do not have constant or long standing complaints.

This was a very beautiful demonstration of the various colonic states.

Dr. Russell Morse: There is no question but that the condition of the colon may reflect the mental state of the individual. Also, the state of the colon is often reflected in the mental state of the individual. Many patients who are under strain, mental or emotional, have abnormalities in the motor function of the large bowel. These changes may exceed the normal to the point that they produce symptoms of constipation, occasionally diarrhea, and in most instances abdominal distress.

Jas. K. Anderson, M.D.,
Secretary.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 8, 1936

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, on Wednesday evening, April 8, 1936. The meeting was called to order at 8 o'clock by the President, Dr. Thomas S. Roberts.

There were fifty-two members and four guests present.

Minutes of the March meeting were read and approved.

The scientific program followed.

SOME PRACTICAL APPLICATIONS OF ACOUSTICS IN MEDICINE

Illustrated by Sound Pictures and Slides

Horace Newhart, M.D.
and
Henry E. Hartig, Ph.D.†
(by invitation)
Minneapolis

Sound plays an increasingly important rôle in medicine. We have accepted so casually the rapid growth in our knowledge of the properties and possible applications of sound that we are prone to overlook its rôle in relation to the etiology, diagnosis, prevention, treatment and amelioration of disease.

As introductory to the presentation of the excellent sound moving pictures* on (a) Sound Waves and Their Sources and (b) Fundamentals of Acoustics, made possible by the newly organized and very efficient Department of Visual Education of the University of Minnesota and the paper to be read by our guest speaker, Dr. Henry E. Hartig, of the Department of Electrical Engineering, reporting the results of an extensive investigation of commercial hearing aids, a brief consideration of some of the basic facts concerning sound as related to medical practice seems in order at this meeting.

1. A fundamental fact which as physicians we never should forget is the physiological factor of safety, by virture of which man normally possesses an acuity of hearing materially greater than he needs to meet his ordinary requirements in civilized life. Thus a person can sustain a very considerable loss of hearing without noticeable inconvenience and without even being aware of his defect. Inspection of Table I shows how acute is our normal hearing and also how unsuitable is the human voice as a means for testing hearing acuity, especially in the detection of a slight, but very often significant, hearing loss.

Table II shows the great variation in the audibility of the various components of articulate speech. It explains why a relatively slight degree of hearing loss, especially for the high tones, interferes with the correct interpretation of speech, the weaker consonant sounds becoming imperceptible while the more dynamic vowel sounds are still heard.

2. A second important principle often overlooked is that a tone or noise of given loudness masks or makes impossible of perception other simultaneously produced sounds which are of a less degree of loudness or intensity. In other words, a listener is made to have for the time a hearing loss equal to the loudness of the masking sound. (The standard unit employed to designate degrees of loudness, acuity of hearing and degrees of hearing loss is the decibel, abbreviated db.) This fact makes it all-important that any tests in order to be sufficiently delicate and accurate to disclose slight degrees of hearing impairment must be conducted in places relatively free from the interference both of external noises and those caused by reverberation from nearby reflecting surfaces.

3. One's hearing acuity is determined by the acuity of hearing of his better ear. Thus it not infrequently happens that a person may entirely overlook or ignore a considerable hearing loss in one ear. For this reason he often fails to seek medical aid when it might be most effective.

4. In testing the hearing of each ear separately by means of the conversational or the loud voice, the better ear, if it is normal or only moderately impaired,

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†Associate Professor of Electrical Engineering, University of Minnesota.

*The sound films shown were prepared by Erpi Consultants, Inc., for the University of Chicago, under the supervision of Prof. Harvey B. Lemon and Prof. Hermann I. Schlesinger of the University of Chicago, Dr. Harvey Fletcher of Bell Telephone Laboratories, and Dr. Donald MacKenzie of Electric Research Products, Inc.

Hearing Loss Sensation Units (db)	Average Whisper	Loud Whisper or pp Voice	mf Voice	ff Voice
0	39.5 ft.	222 ft.	1250 ft.	1⅓ mi.
5	22.2 ft.	125 ft.	704 ft.	3950 ft.
10	12.5 ft.	70 ft.	395 ft.	2220 ft.
15	7.0 ft.	39.5 ft.	222 ft.	1250 ft.
20	4.0 ft.	22.2 ft.	125 ft.	704 ft.
25	2.2 ft.	12.5 ft.	70 ft.	395 ft.
30	15.0 in.	7.0 ft.	39.5 ft.	222 ft.
35	8.5 in.	4.0 ft.	22.2 ft.	125 ft.
40	4.7 in.	2.2 ft.	12.5 ft.	70 ft.
45	2.7 in.	15.0 in.	7.0 ft.	39.5 ft.
50	1.5 in.	8.5 in.	4.0 ft.	22.2 ft.
55	.8 in.	4.7 in.	2.2 ft.	12.5 ft.
60	......	2.7 in.	15.0 in.	7.0 ft.
65	......	1.5 in.	8.5 in.	4.0 ft.
70	......	.8 in.	4.7 in.	2.2 ft.
75	......	......	2.7 in.	15.0 in.
80	......	......	1.5 in.	8.5 in.
85	......	......	.8 in.	4.7 in.
90	......	......	......	2.7 in.
95	......	......	......	1.5 in.
100	......	......	......	.8 in.
110	......	May be reached by speaking tube		
115	......			
120	......	Totally deaf		

TABLE I. MAXIMUM DISTANCES IN A QUIET PLACE FREE FROM REFLECTIONS FOR INTERPRETING CALLED NUMBERS BY PERSONS HAVING VARIOUS AMOUNTS OF HEARING LOSS

TABLE II. RELATIVE PHONETIC POWERS OF THE FUNDAMENTAL SPEECH SOUNDS AS PRODUCED BY AN AVERAGE SPEAKER[†]

ȯ (haul)	680	ū (rule)	310	ch (church)	42	k	13
a (father)	600	i (tin)	260	n	36	v	12
o (but)	510	ē (greet)	220	j (judge)	23	th (this)	11
ȧ (fat)	490	r	210	zh (azure)	20	b	7
ō (go)	470	ℓ	100	z (haze)	16	d	7
u (full)	460	sh (ship)	80	s (ace)	16	p	6
ā (fame)	370	ng	73	t	15	f	5
e (get)	350	m	52	g (go)	15	th (thin)	1

cannot be excluded by the customary expedient of plugging its canal with the finger tip. To exclude effectively the ear not being tested, it is necessary to use a noise-producing exclusion apparatus like that of Bárány. Neglect to observe this principle often leads to serious inaccuracy and may even result in death through failure to recognize sufficiently early the presence of a total deafness occurring in labyrinthine involvement.

The above are fundamentals of acoustics which every otologist and medical practitioner should never allow himself to forget.

In regard to sound as a cause of disease, it is well known that loud, sudden or prolonged tones or discordant sounds, or noises, not infrequently produce injury of the middle and inner ear, resulting in degenerative changes with definite loss of hearing acuity. Such cases are common in otologic practice.

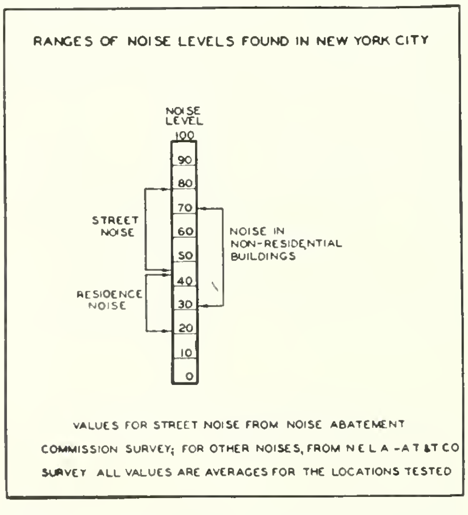
The harmful effects of noises are by no means limited to the ear. Studies made decades ago and surveys recently conducted by noise abatement committees have proved that the noises prevailing in cities produce deleterious effects on health. They cause retarded growth in infancy, loss of sleep, fatigue, irritability and various functional nervous and emotional disturbances. They produce lessened efficiency among pupils, teachers and those engaged in professional pursuits and cause lessened output by industrial workers. The noise levels in larger cities caused by surface, elevated and subway traffic, construction operations, unrestricted use of radio, whistles, bells, automobile horns, the voices of street vendors and scores of other unnecessary noises vary according to the density of population and many other conditions. They invade hospital, school and residential districts. The noise levels of different locations are shown in Figure 1, and range from 20 db to 90 or more db. Indoor noise levels are shown by Figure 2.

Many of our most valuable diagnostic procedures are based upon the correct interpretation of sound as in direct, stethoscopic, obstetric and percussion auscultation. Even the qualities of the patient's voice and his speech characteristics as judged by the trained ear of the physician often yield valuable diagnostic data. Such possible information is easily missed when the examination is conducted in a noisy place or if, unfortunately, the examiner has a hearing defect. The result of a serious interview between a patient and a most skillful internist, pediatrist or psychiatrist often is made unsatisfactory by distracting or interrupting noises.

The standards of modern otologic practice especially demand that hearing tests for the detection of a hearing loss and the determination of its degree and type be made in places free from interfering noises. For the otologist to attempt to test acuity of hearing in a noisy room is as absurdly inconsistent as it would be for the ophthalmologist to do a refraction in a room in which a cloud of smoke or mist partially obscures the test objects.

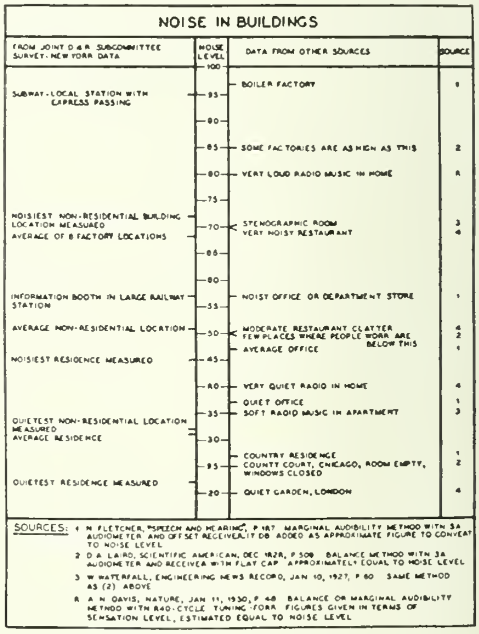
Not until recent years has the importance of the early detection of slight hearing loss been properly appreciated. In the young such a discovery indicates the probable presence of a significant hearing loss capable of causing in the school child retardation, speech defects or even an inferiority complex. If overlooked or neglected and the causes are not promptly sought and corrected, a seriously handicapping hearing defect may result sooner or later in life.

In adults, insidiously progressive degeneration of the cochlear apparatus is often first indicated by a loss of power to perceive the high tones. This condition is revealed only by a careful functional test. The discovery of such a loss demands prompt medical attention to disclose any causes requiring correction.



VALUES FOR STREET NOISE FROM NOISE ABATEMENT COMMISSION SURVEY; FOR OTHER NOISES, FROM N E L A - A T & T CO SURVEY ALL VALUES ARE AVERAGES FOR THE LOCATIONS TESTED

Fig. 1. From City Noise. Report of Noise Abatement Commission, Department of Health, New York City, 1930.



SOURCES:
1 H FLETCHER, "SPEECH AND HEARING", P 187 MARGINAL AUDIBILITY METHOD WITH 3A AUDIOMETER AND OFFSET RECEIVER. 17 DB ADDED AS APPROXIMATE FIGURE TO CONVERT TO NOISE LEVEL
2 D A LAIRD, SCIENTIFIC AMERICAN, DEC 1928, P 508 BALANCE METHOD WITH 3A AUDIOMETER AND RECEIVER WITH FLAT CAP APPROXIMATELY EQUAL TO NOISE LEVEL
3 W WATERFALL, ENGINEERING NEWS RECORD, JAN 10, 1927, P 60 SAME METHOD AS (2) ABOVE
4 A H DAVIS, NATURE, JAN 11, 1930, P 48 BALANCE OR MARGINAL AUDIBILITY METHOD WITH 840-CYCLE TUNING FORK FIGURES GIVEN IN TERMS OF SENSATION LEVEL, ESTIMATED EQUAL TO NOISE LEVEL

Fig. 2. From City Noise. Report of Noise Abatement Commission, Department of Health, New York City, 1930.

[†] From H. Fletcher. Speech and Hearing. Van Nostrand, 1929.

These facts emphatically indicate the wisdom of a regular, periodic, carefully made hearing test as a part of the individual health program at all ages.

It is the consensus of opinion of several hundred leading otologists that the most satisfactory means of accurately testing the hearing is by the use of a reliably constructed audiometer capable of producing pure tones free from harmonics, covering a frequency range from 64 or 128 to 8,192 double vibrations per second, and having an intensity range from ten decibels below the normal threshold of hearing to near the threshold of feeling. The intervals of graduated intensity should be not greater than five decibels and the intervals for pitch, if not continuous, in the frequencies from 200 to 4,000 cycles, should be in half octaves. A satisfactory standardized bone conduction receiver as well as a high-grade air conduction receiver is now recognized as vitally essential for accurate determination of hearing loss and the prescription or selection of an electric hearing aid best suited to the needs of a person having a severe hearing loss.

There has been a growing, insistent demand for reliable audiometers at a reasonable price. Several manufacturers lately have promised to meet this need. Very recently a sub-committee of the Sectional Committee on Acoustical Measurement and Terminology of the American Standards Association, composed of acoustic engineers and otologists, has been appointed to formulate minimum standards of performance for a satisfactory audiometer. As soon as these standard requirements shall have been made public and duly met by the manufacturers, standardized audiometers which will merit the approval of the Council on Physical Therapy of the American Medical Association will be available. At such time and only when thus safeguarded, the audiometer should find widespread, satisfactory use among otologists, neurologists, general practitioners, school physicians, insurance examiners and the directors of the medical departments of railroads and other large employers of labor. Such a wide use of the audiometer will make possible larger and more successful efforts in the field of deafness prevention and amelioration.

Already the testing of large groups of school children by means of the phonograph audiometer to disclose those with a significant hearing loss has yielded excellent results in many communities.

Acoustic engineering recently has greatly increased the possibilities of ameliorating the condition of hundreds of thousands of persons afflicted with a handicapping hearing loss by making available more efficient electric hearing aids. These have been improved in their performance characteristics, reliability, inconspicuousness and appearance. They have a much wider range of application, being now successfully used by hard of hearing school children, both individually and in class groups for instruction in correct speech and other subjects. Also, because of better performance, many adults who have been unable satisfactorily to use a hearing device now find great help in the newer hearing aids.

The physician, who is often consulted in regard to hearing aids, can be of great assistance to a patient in selecting the type of instrument best adapted to his individual requirements. In assuming this responsibility he should be guided by certain principles.

1. A person whose hearing loss in his better ear does not exceed forty decibels, as a rule, does better without a hearing device.

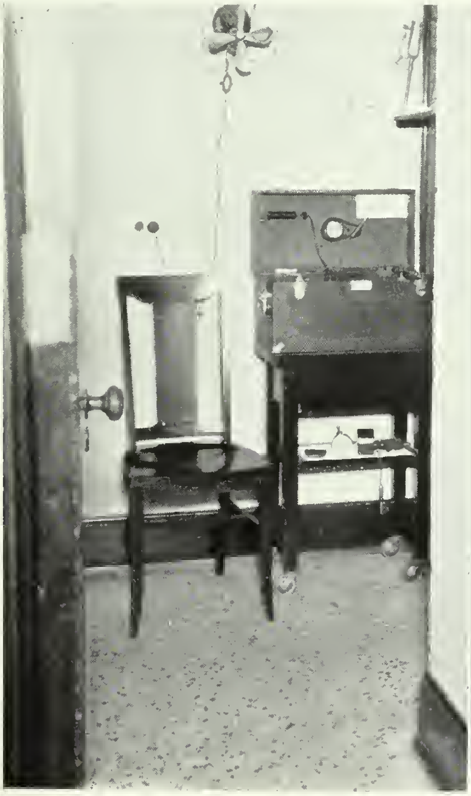


Fig. 3. Small, serviceable, acoustically treated ear testing room, 4′1″x7′9″, with floating ceiling and heavily carpeted floor, in physician's office.

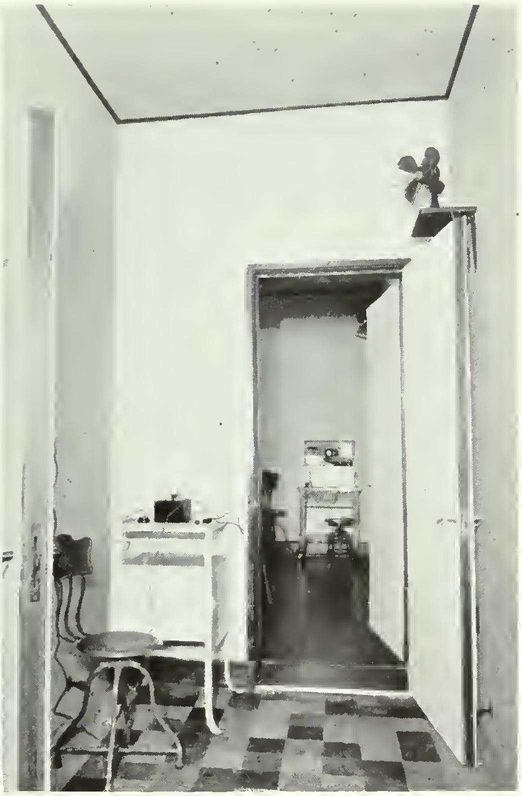
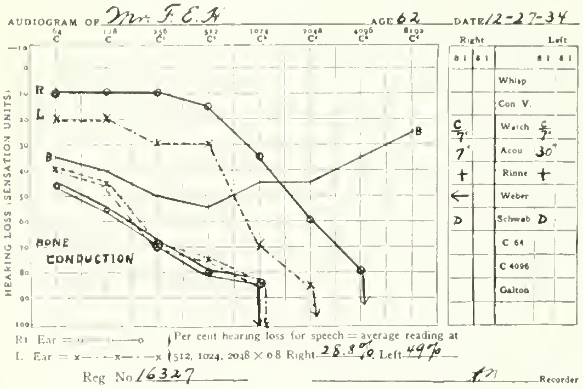


Fig. 4. Two connecting sound proofed ear testing rooms, each 5′6″x12′, in University of Minnesota Hospital, Division of Otology. Ceilings and floor floated on sponge rubbed. Double doors sealed with sponge rubber and equipped with refrigerator latches.

2. On the other hand, as soon as his loss reaches or exceeds forty decibels, he should be advised to secure promptly the hearing aid best suited to his requirements as determined by a careful otological examination, including an audiogram showing his hearing loss both by air and bone conduction. If he delays he will too often find it impossible to interpret in terms of speech the unfamiliar sounds he first hears with his instrument.

Recent investigations of commercial hearing aids conducted at the University of Minnesota, a report of which has been accepted for publication in the Archives of Otolaryngology, show that stock hearing aids differ greatly in their performance characteristics.



Audiogram of hearing loss for air and bone conduction, useful in determining most satisfactory type of hearing aid required

Fig. 5. Audiogram made with Western Electric 2-A audiometer in acoustically treated room. Line B-B is graph for normal bone conduction.

The ultimate proof that an individual has selected the most satisfactory instrument is to be found only by making a comparative intelligibility test of several instruments of different manufacturers, uninfluenced by any one interested in the sale of a hearing device. (See footnote at end.)

The problem of noise abatement as a measure for better hearing, increased health and greater efficiency is too large to be solved in a short time. United action by an aroused, enlightened public under the leadership of medical men and physicists is accomplishing much to decrease unnecessary noise in some American cities.

Until the movement for doing away with unnecessary noises shall have achieved widespread results, every physician can successfully meet his individual problem of reducing to a practical minimum the noise level of his immediate surroundings. To do so he need only follow the example of the more progressive shopkeepers, restaurant and hotel managers, theater owners, hospital superintendents and managers of large business offices. These have already shown a keen appreciation of the many advantages of reducing the noise level in their places of business.

Any physician, with the help of an acoustic engineer and a carpenter, at a relatively small cost can eliminate the most objectionable interfering noises from his immediate environment and thus add greatly to his personal efficiency and increase his joy in his work. Thus he will attain greater accuracy in his exacting diagnostic efforts, especially in making hearing tests, and will add materially to the ease and confidence of his patients.

AUTHOR'S NOTE

Since the above was written, the House of Delegates of the American Medical Association, on recommendation of the Judicial Council, at its 1936 meeting passed the following resolution:

"WHEREAS: Certain mechanical aids for physical defects are now being sold through the promise of a commission to persons effecting such sales: therefore be it

"RESOLVED: That the practice of offering any commission or bonus to any person not an authorized agent, is condemned as unfair to the purchaser of mechanical aids. The acceptance of such commission by a physician violates the principles of medical ethics: and be it further

"RESOLVED: That the fitting of such aids or appliances by laymen without medical supervision constitutes the practice of medicine and should be brought to the attention of the offending manufacturer, and of the competent medical licensing authority concerned. Fraudulent, exaggerated or inaccurate claims for such devices may work great hardship upon handicapped individuals: Such appliances require investigation by the Council on Physical Therapy of the American Medical Association, or other equally competent authority, and approval by the said Council before publication of any such statements."

It thus condemns as unethical the acceptance of a commission or bonus by a physician from an agent of a hearing aid manufacturer for referring a patient to whom the latter effects a sale.

Under its broadest application it interprets the use of the audiometer for purposes of diagnosis and treatment of ear diseases by persons other than regularly qualified physicians, or those working under their direction, as engaging in the practice of medicine.

The American Otological Society at its annual meeting in May, 1936, endorsed the above resolution. It also commended the co-operation of the American Standards Association's Subcommittee on Audiometers and Hearing Aids and the Council on Physical Therapy of the American Medical Association in their efforts to make it possible for the physician to obtain reliable, approved, standardized audiometers. By unanimous vote the Society disapproved of the use of the audiometer for purposes of diagnosis and treatment by persons other than regularly qualified physicians or persons working under their direction.

PERFORMANCE CHARACTERISTICS OF ELECTRICAL HEARING AIDS FOR THE DEAF*

HENRY E. HARTIG, Ph.D.

and

HORACE NEWHART, M.D.

Abstract of Dr. Hartig's Paper

The common practice of relying entirely upon measurements of a person's threshold of hearing as a criterion of hearing loss is criticized as inadequate. It is suggested that since an auditor listens to speech, not at the threshold of hearing but at much higher loudness levels, threshold tests are made to bear too heavy a burden when the entire responsibility for measuring hearing loss is placed upon them. The necessity is pointed out for an audiometric study of the equal loudness levels of persons having hearing defects, extending from the threshold of hearing to normal hearing intensities. Sound amplification for hearing loss correction on a frequency selective basis is considered and it is concluded that present knowledge does not warrant acceptance of the theory but rather points toward the necessity for further study. The older uniform amplification ideal is examined, especially with reference to the ability of commercial portable carbon microphone hearing aids to satisfy the ideal. After a preliminary investigation of commercial hearing aids, in which the less effective or worthless devices were eliminated, an extensive series of tests was conducted upon four stock hearing aid models of popular make.

It was found that none of the four closely approached the ideal of uniform amplification. Articulation and sentence intelligibility tests showed that the four models differed very greatly in their speech transmission characteristics, varying from excellent to poor. In amplifying power also, the differences were considerable but not excessive. Methods for investigating the causes of poor transmission char-

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*This paper, with illustrations, has been accepted for publication in full in the June, 1936, number of the Archives of Otolaryngology.

acteristics indicate the defect to be associated with wave form distortion which has the effect of introducing extraneous noises in the speech output.

The differences in performance were not found to depend measurably on differences in uniformity of response. In consequence, it is concluded that furnishing frequency response curves to the otologist with each hearing aid would be of no value. Of greater importance is a wide range of response (as a minimum, 200 to 3,000 cycles per second), freedom from singular amplification peaks, and sufficient amplification. Of paramount importance is the actual aid the user obtains in interpreting speech sounds and sentences correctly.

A method is suggested which enables the otologist, by means of a tapered horn, to listen directly to the sound output of a hearing aid. While the method is not free from objection, it should serve to enable the otologist to eliminate from consideration some of the worst of the commercial carbon microphone hearing aids now being offered to the hard of hearing public.

An attempt was made to devise a rational test for bone conduction oscillators but no wholly satisfactory procedure was found. By transmitting the vibratory oscillator output through a heavy leather belt to an electrical phonograph reproducer, the amplified electrical output of which in turn was converted to sound, intelligibility tests were conducted. These tests confirmed the estimate of relative merit of the four hearing aids as previously determined by the use of the air conduction receivers.

The President expressed the appreciation of the members of the Academy to Professor Hartig and Dr. Newhart for this very interesting program.

The meeting adjourned.

R. T. La Vake, M.D., *Secretary*.

NEWS ITEMS

Dr. G. A. Sarchet, Mobridge, S. D., is taking a six weeks' vacation through Alaska.

Dr. H. A. LaFleur, of Portland, has purchased the practice of the late Dr. R. H. Beek at Lakota, N. D.

Announcement of an early fall wedding, Dr. L. T. Lohrbauer and Miss Sue Thornson, of Grand Forks, N. D.

Dr. Peter Potter has been elected president of the Murray Hospital at Butte, Mont., and Dr. W. H. Rex, secretary.

Dr. T. V. Moore, a former well-known physician of Billings, Montana, died recently at his home in San Jose, Calif.

Dr. R. C. Ray, Heron Lake, Minn., has moved to Garrison, N. D., where he will join his father in general practice.

Dr. H. D. Lien, formerly in practice at Eureka, has moved to Mobridge, S. D., and is now associated with the clinic of that city.

Dr. M. E. Pickworth, formerly of Cleveland, Ohio, has joined the staff of the Healy, Law, Wouat, Moore Clinic at Grand Forks, N. D.

Dr. A. Erickson, a graduate of the University of Minnesota in the class of 1934, has opened offices for general practice at Sanborn, Minn.

Dr. O. E. Sarff, formerly of Buhl, is now located at Virginia, Minn., where he will continue general practice. Dr. Sarff is a graduate of the University of Minnesota.

Mr. G. D. Georgopoulos, Faribault, Minn., must serve a six months' sentence in jail for practicing without a license.

Dr. Russell Gates, after spending several months in practice in California, has returned to Minot, N. D., and is again associated with the Northwest Clinic, of that city.

President Fligman and Secretary Balsam of the Montana Medical Association spent ten days last month in visiting about 20 medical societies in different sections of that state.

Dr. Henry E. Michelson of Minneapolis has been selected to make the American contribution to the Festschrift of Professor Finger of Vienna, the noted Austrian syphilologist.

The first anniversary of the founding of the Duluth Surgical Society was observed last month, with many prominent surgeons being present from Wisconsin and Minnesota.

Miss Harriet S. Hartry, who was a former superintendent of St. Barnabas Hospital, Minneapolis, for over 30 years, died at her home in Newmarket, Ontario, last month.

Dr. H. O. Henry, Minneapolis, has moved to Hector, Minn., and opened offices for general practice. Dr. Henry is a graduate of the University of Nebraska Medical School.

A new Indian hospital is now being constructed at Cass Lake, Minn., that will have a capacity of about 40 beds, and when completed and furnished will cost about $100,000.

Dr. Kenneth A. Phelps, Minneapolis, read a paper entitled "Bronchial Obstruction in Chronic Tuberculosis" before the American Bronchoscopic Society at Detroit, Mich., May 27.

Dr. William J. Mayo, of Rochester, Minn., received the honorary degree of doctor of laws after delivering the address at the ninety-second annual commencement exercises of the University of Notre Dame.

One J. E. Squire, aged 42 years, who has been attempting to practice medicine at Moorhead, Minn., was given the opportunity to leave the state at once, or stand prosecution. He departed promptly.

Drs. L. H. Fligman, president, and E. G. Balsam, secretary of the Montana Medical Association, were the guest speakers at the monthly meeting of the county medical society recently held at Great Falls.

Dr. H. P. Hanson, Beresford, one of the pioneer physicians of South Dakota, passed away last month at the advanced age of 90 years. Dr. Hanson had always taken an active part in church and all community activities.

The new officers of the Redwood-Brown Counties, Minn., Medical Society for the coming year are: Drs. C. A. Saffert, New Ulm, president; C. J. Fritsche, New Ulm, secretary, and Francis Gibbons, Comfrey, vice-president.

Dr. Maysil M. Williams, Valley City, is North Dakota State Health Officer, and at her appointment in 1933 was the first woman to assume that position in any state. Since that time Pennsylvania has elevated a woman to that post.

Dr. J. M. Phillips, Bisbee, N. D., physician, was convicted of second degree murder, the result of an illegal operation he was alleged to have performed on a Dunseith girl. The young woman later died. The jury recommended 10 years in prison.

Dr. E. W. Exley, Minneapolis, passed away suddenly on May 28, after a very few days' illness at a New York City hospital, where he was attending a medical meeting. Dr. Exley was 37 years of age and a University of Minnesota graduate.

Minnesota's crippled children, estimated to number 10,000, will have a new opportunity for care and rehabilitation when special aid financed by a $50,000 annual federal allotment will be started through a new division of the state board of control.

Dr. John Sutherland, aged 79 years, who has been in active practice for many years at Britton, S. D., passed away on May 28. Dr. Sutherland held degrees from several European universities, and has contributed many valuable papers that have been published in The Journal-Lancet.

Members of the faculty and students of the school of medicine, University of Minnesota, who claim Iowa as their native state gave a dinner in honor of Dr. Walter L. Bierring of Des Moines, former president of the American Medical Association. Dr. Harold S. Diehl, dean of medical sciences at the university was toastmaster.

Dr. J. P. Miller, Grand Forks, was elected president of the North Dakota Academy of Ophthalmology and Oto-laryngology. Dr. H. Rosenberger, Bismarck, vice-president and Dr. F. L. Wicks, Valley City, secretary. Dr. Erling W. Hanson, Minneapolis, was the visiting clinician and spoke on "Allergy in Ophthalmology." Other speakers were: Drs. G. A. Larson, Fargo; G. M. Constans, Bismarck, and N. A. Youngs, Grand Forks.

Dr. Gilbert J. Thomas, Minneapolis, was elected president of the American Urological Association at the recent Boston convention. The doctor has started immediate plans to bring the 1937 meeting of the association to Minneapolis. Dr. Thomas, graduate of Northwestern University, was on the staff of the Mayo Clinic at Rochester from 1909 to 1918, and now is attending urologist at the Glen Lake sanatorium, St. Mary's, Eitel and University hospitals.

Nine members of the University of Minnesota Medical School staff, who are retiring at the end of the current college year, were honored by their associates at a complimentary dinner. The nine are: Dean Elias P. Lyon, Drs. Charles Horace Mayo, C. A. Erdmann, James T. Christison, James B. Gilfillan, Thomas B. Hartzell, John T. Rogers, John L. Rothrock and Franklin B. Wright. A portrait of Dean Lyon will be presented by the department and division heads of the medical school.

Dr. James Tate Mason, Seattle, Wash., 55 years old, noted surgeon who was elevated to the presidency of the American Medical Association in one of the most dramatic meetings that body ever held, died June 20. He suffered an arterial blood clot April 6 which necessitated the amputation of his right leg May 2. Critically ill, Dr. Mason was unable to attend the national convention at Kansas City to accept personally the honor the medical association had voted him the year before.

A monument to Dr. Perry H. Millard, first dean of the University of Minnesota Medical School, whose grave has been unmarked in the Fairview cemetery, Stillwater, Minn., for more than 40 years, was dedicated at services in that cemetery June 7. Dr. Millard is credited with being responsible for the formation of the medical school at the university, and was its dean from 1888 until his death in 1897. Most of the initial laws governing medicine in Minnesota, and the licensing of physicians by an examining board, are said to have been written by him.

Richard R. Price, director of the General Extension Division of the University of Minnesota, Minneapolis, has requested The Journal-Lancet to assist him in securing the opinions of Northwest physicians on (1) what is the best time of the year to hold post-graduate courses for practising physicians? (2) What subjects are most desired? (3) How long should the courses be? and (4) would you be interested in a resident course of from two to four weeks' duration? This survey of opinion is being conducted by the University of Minnesota in conjunction with the Committee on Hospitals and Medical Education of the Minnesota State Medical Association. Replies should be addressed to Mr. Price at the above address.

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BOOK NOTICE

PATIENT'S GUIDEBOOK

Bewildered Patient, by MARIAN STAATS NEWCOMER, M.D., with a foreword by HENRY S. PATTERSON, M.D., director of Saint Luke's Hospital, New York City; first edition, dark blue cloth, red stamped, 312 pages plus appendix, no illustrations; Boston: Hale, Cushman & Flint: 1936. Price, $1.75.

Dr. NEWCOMER is a New York practitioner who was visited by the idea that a little knowledge, medically speaking, would not be a dangerous thing in the person of the public. In this little volume the author tells the patient how to select his physician, how to find the physician best suited to treat the individual case, what quackeries and nostrums to avoid, superstitions and old wives' tales to disregard, and a host of other matters which the patient ordinarily never learns.

Bewildered Patient should not be considered a "family doctor book," for it is anything but that. It is a reasoned, sound, instructive guidebook for the average patient, and it is certainly well worth the modest price asked for it. It has been carefully checked by a number of specialists in various fields of medicine.

OFFICE PRACTICE RECTAL DISEASE TEXT

Rectal Diseases in Office Practice, by LAWRENCE GOLDBACHER, M.D.; first edition, dark red cloth, gold-stamped, 176 illustrations (some in color), 448 pages; Philadelphia: L. Aubrook & Company: 1936. Price, $9.75.

Dr. GOLDBACHER, who is chief of the department of proctology of the Women's Homeopathic Hospital in Philadelphia, has originated an injection technic for the treatment of pruritis ani. This technic is presented in this volume; but there is much else. He holds, for instance, that most diseases of the rectum can be treated in the office, without recourse to hospitalization. He is a champion of the injection treatment of hemorrhoids. He rejects excision of anal fissure, saying that it should be treated by divulsion or injection.

The book is very complete, and it has some graphic illustrations (most of them original) which delineate the various technics of procedure so that a minimum of words are expended. While this work does not rank with that of BUIE's for authority and inclusion, it is nevertheless valuable as a good guide to routine office treatment of rectal conditions.

A USEFUL LITTLE PRESCRIPTION MANUAL

The Medical Formulary and Prescription Manual, by MORRIS DAUER, Ph.G.; first edition, blue fabrikoid, gold-stamped, 279 pages plus index, no illustrations; Brooklyn, New York: Morris Dauer, 1733 Union Street. Price, $3.50, postpaid of the author.

This is an indispensable little volume. Of small and very convenient size, it is as full of vital and practical information as one could wish in a work of this kind. Mr. DAUER is chief pharmacist for Kings County Hospital in Brooklyn, and his text has been approved by the Department of Hospitals of the City of New York.

Although space does not permit elaborate exposition of the contents of this manual, it may be said that every preparation in it may be compounded with ordinary pharmaceutical technique. The section on pediatrics is exceptionally good. Mr. DAUER has employed both the metric and the apothecary's system, which considerably aids the general practitioner. In addition to the simple prescriptions noted, there are scores of practical helps and informative bits, making this volume noteworthy. It may be recommended highly.

PLASTIC SURGERY

New Faces—New Futures, by MAXWELL MALTZ, M.D., with a foreword by ALFRED ADLER, M.D., first edition, dark blue cloth, gold-stamped, 304 pages plus bibliography and index, several halftone engravings; New York City: Richard R. Smith, Inc. 1936. Price, $3.00.

Dr. MALTZ is a past president of the American Society of Plastic Surgeons, is 37 years old, and is at present the chief of one of the recently-established municipal plastic surgery clinics in New York City. He has demonstrated in plastic surgery at the Royal Institute of Surgery in Rome, and in the Universities of Berlin and Amsterdam.

This book is almost exclusively for the public. It is graphically-presented: the photographs are no more arresting than the text. Both are very clear. With the exception of divers phrases (such as "Mr. Gump and Dick Tracy," or "A New Deal for Cyrano") which Dr. MALTZ has obviously tossed in for popular effect, this is a very instructive volume for the lay reader. Some of the results which Dr. MALTZ presents photographically are actually amazing. It is a pity that the publishers chose to imprint a "horror motif" blurb on the back of the dust jacket, recounting the story of a Washington University student who killed himself because of his big nose—and then added the line, "This Life Could Have Been Saved by Plastic Surgery!" Otherwise, the work is very interesting.

THIRD EDITION OF SPEED'S FRACTURES

A Text-Book of Fractures and Dislocations, by KELLOGG SPEED, S.B., M.D.; third edition, 1,000 pages, 1,042 engravings, dark red cloth, gold-stamped; Philadelphia: Lea & Febiger, Inc.: 1935. Price, $11.00.

Dr. SPEED, professor of clinical surgery in the Rush Medical College of the University of Chicago, has done so thorough a job in the revision of this standard text that no matter how rare a specific fracture or dislocation may be, it is possible to find it fully considered in this volume.

The work in its first two editions was well-known. What is of interest here, therefore, is the extent of Professor SPEED's revision. He re-wrote most of the text, and added many new drawings or illustrations to the already copious supply. He re-wrote the chapters on treatment and operative procedure. Open fractures are very extensively considered, as well they should be, considering the increasing levy of automobile accidents. The fractures and dislocations of each part of the body are well-handled. Indications for operation are complete. Reconstruction of the femur, to which so much attention has been devoted by our modern orthopedists, is exhaustively treated.

This book may be considered as an authoritative text for any purpose. It is of equal value to the experienced orthopedic surgeon or to the general practitioner. When surgeons produce such noteworthy volumes as this one of Professor SPEED's, they cannot be too highly commended.

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1936

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PROCEEDINGS
of the
HOUSE OF DELEGATES
of the
FORTY-NINTH ANNUAL MEETING
of the
NORTH DAKOTA STATE MEDICAL ASSOCIATION

Sunday, May 17, 1936

The first meeting of the House of Delegates was held at the Gladstone Hotel, Jamestown, North Dakota, and was called to order at 7:00 P. M., by the President, Dr. A. D. McCannel, Minot.

ROLL CALL

Secretary Skelsey called the roll, and the following Delegates, Councilors and Officers responded:

Drs.:
Murdoch MacGregor, Fargo.
G. F. Drew, Devils Lake.
G. M. Williamson, Grand Forks.
F. L. Wicks, Valley City.
N. O. Ramstad, Bismarck.
P. G. Arzt, Jamestown.
L. B. Greene, Edgeley.
E. L. Goss, Carrington.
A. E. Spear, Dickinson.
T. H. Lewis, Fargo.
R. E. Pray, Fargo.
H. O. Ruud, Grand Forks.
P. H. Woutat, Grand Forks.
P. E. Hoeper, Williston.
R. W. Pence, Minot.
A. R. Sorenson, Minot.
A. W. MacDonald, Valley City.
H. A. Brandes, Bismarck.
O. T. Benson, Glen Ullin.
F. W. Fergusson, Kulm.
R. C. Little, Mayville.
A. D. McCannel, Minot.
Albert W. Skelsey, Fargo.
W. W. Wood, Jamestown.
W. H. Long, Fargo.
W. A. Gerrish, Jamestown.
C. E. Stackhouse, Bismarck.
J. M. Bowen, Dickinson.
J. P. Aylen, Grafton.
A. L. Cameron, Minot.

The President declared a quorum present and the House duly constituted for the transaction of business.

MINUTES

Secretary Skelsey moved that the minutes of the Forty-eighth Annual Session, as published in The Journal-Lancet, August 15, 1935, be adopted, and the reading of the minutes omitted.

The motion was seconded by Dr. Murdoch MacGregor of Fargo, and unanimously carried.

REPORT OF THE SECRETARY

Secretary, Dr. A. W. Skelsey, presented the following report:

For the calendar year 1935 we had a paid membership of 393. For the year 1936 to date we have already 367. This compares very favorably with the financially prosperous years.

The American Medical Association now has a membership of 101,754, the largest for some time. This may be due in part to economic conditions unfavorably affecting our profession, and the desire to get under the protecting wing of Headquarters; also perhaps due to the fact that some of the state societies have requested the medical colleges to urge upon their graduates the necessity and the value to themselves of supporting the national and local organization.

The Journal-Lancet: Effective January, 1936, that magazine became a monthly publication, and the plan will be continued. At intervals during the past year special numbers have been issued. The arrangement appears to have given satisfaction. Both Mr. Cohen and Dr. J. A. Myers have written us that as the year 1937 will commemorate the fiftieth anniversary of our Association, they would be greatly pleased to arrange for the publication in that year of a number especially devoted to this Society.

Meetings: We were represented at the annual sessions of the American Medical Association held in Atlantic City, June, 1935, by State Secretary Skelsey, and report thereof has been printed in The Journal-Lancet for August 15, 1935. There was also representation of our organization by President McCannel and Dr. L. W. Larson, Chairman of the Committee on Public Policy and Legislation, at the February meetings of the Northwest Regional Conferences and of other societies then in session in Chicago. The executive committee met in Bismarck last March.

Economics and the Medical Profession: So far as the country at large is concerned, that country is yet well bewildered. The American Federation of Labor claims there are over twelve million persons unemployed; the Federal Government would place it at ten million. Secretary of the Treasury Morgenthau advises that the Federal deficit for the year ending June 30, 1936, will probably total six billion dollars.

Two exiled German economists, now with the New York School for Social Research, publish their recent findings, in substance that sixty-six per cent of our national UPTURN has been due to what they designate the "PUMP PRIMING" of our Federal spending. They believe that this stimulating but enormously large financial expenditure by our national government can be diminished without causing a business recession. In any event, consider the plight of the unhappy taxpayers.

Keen competition continues between medical men, hospitals, and allied concerns. The plan of affording hospitalization for a definitely small annual payment seems satisfactory to some of the organizers. In the East particularly just now an attempt is being made to have medical men properly represented upon hospital boards, rather than laymen in the majority—the latter having undue control, to the disadvantage of the medical profession. Unethical plans, especially by clinics, are also in evidence. The noted Ross-Loos Clinic affair was referred to the Legal Council of the A. M. A., and by that body remanded to the California State and County Societies, with the decision that inasmuch as the original procedure ejecting that Clinic from those organizations was defective, said Clinic must be restored to good standing. Doubtless the implication was that once more the plan for the ejection be started, yet with stricter attention to detailed technique. The New York Times of January 18, 1936, carries an item showing that in another Western state one large city gets for about $1.50 monthly, medical care of all kinds for about twenty-five per cent of the population. Lately the Cincinnati Academy of Medicine decided that group medical service plan was unethical, and that a violation of such ruling would constitute sufficient reason for termination of membership with said medical body.

Regarding Dakota itself, your Committee on Medical Economics can furnish data at this session. It might be very helpful for our delegates from those counties which have grievances to discuss their problems here.

Health Conditions in the United States: As a whole, an excellent showing for the past year and through the first two months of this year has been made. About maternal mortality, concerning which there has been a great deal of inaccurate and really misleading writing and speaking, it is authoritatively stated that the death rate from conditions arising out of pregnancy and childbirth, which has been declining consistently for a long period of years, bids fair to reach a new minimum this year. However, it is stated that colored women have not shared in the general improvements, and this of course, affects the data given. In an eastern religious journal lately there blazed an hysterical editorial on the subject of Mother's Day Observance, which day we consider to be mainly a commercial enterprise for the lucrative benefit of the florist and the candy seller, etc., requesting the preachers and other speakers to stress the so-called "awful slaughter" of the many helpless mothers and their innocent babies, due in part to the imperfect knowledge of the mothers and in part to the alleged incompetency of many of the physicians; also to the absolute lack of doctors willing to help care for and deliver the indigent mothers.

Venereal Diseases: The Federal Public Health Bureau is directing an attack against this affliction. Dr. Parran, Jr., the new Surgeon-General, expresses his desire to co-ordinate Federal and State Health Agencies, in a nation-wide crusade. This year New York City Health Commissioner Dr. Rice was given $151,000 by the city for its campaign; then the Progress Works Administration gave $100,000 of Federal funds. The latter contribution from the PWA is one of the many and varied uses for which the Democratic Party has been distributing funds evolved by the New Deal, yet in this specific case the taxpayers probably will not unduly complain. Commissioner Rice states that syphilis is today the biggest single problem facing his City Health Department; that there are three hundred eighty thousand (380,000) cases of syphilis in that city, with only one in ten under medical treatment. The trade journal "Drug Topics" of May 4, 1936, commenting upon the proposed campaign, seems a little fearful as regards drug stores and solicitors engaged in the sale of medicinal and mechanical mediums; that the authorities will crusade against them on account of allegedly imperfect prophylactics; but it would not be quite fair to impute syphilis entirely to defective mechanisms of that type.

Deaths and the Automobiles: Collier's for May 9, 1936, contains an editorial captioned "Don't Drink and Drive." It quotes some of the following data: Year 1935—36,100 persons killed and 895,280 injured by automobiles. Included in these casualties were 12,530 broken skulls; 1,790 fractured spines; 14,320 brain concussions; 74,310 broken bones. The insurance companies write that in these cases 3.1 per cent were under the influence of liquor; that in the fatal cases 6.8 per cent were under liquor's influence. This would leave over ninety (90) per cent of all drivers who were apparently sober. For this average ninety per cent "soberites," what plan can be developed to plant common sense and consideration for others into their gray matter? Some of the automobile manufacturers, doubtless fully realizing the damage they have inflicted upon the public by their sales, have undertaken a national "whoopee" about the value of careful driving. The Automobile Manufacturers' Association has financed at Northwestern and at Harvard Universities a Public Safety Institute, having research laboratories for traffic safety problems and headquarters for the traffic control programme of the International Association of Chiefs of Police, including co-operation with the National Safety Council, etc.

Federal Bill Concerning Pure Food, Drugs, Cosmetics, etc.: Reference was made in our report for 1935 to Senate Bill 5, and the heavy propaganda against this form of legislation, by certain manufacturers, with pressure brought to bear upon newspapers concerned about the possibility of restricted or entire loss of that class of advertising. Journal A. M. A., December 21, 1935, has both an editorial and a long article on this subject. Proper legislation seems almost impossible to secure. The New Jersey Medical Society sends us a request made by it nationally to medical associations, asking co-operation in demanding a Congressional investigation UNDER OATH into the proposed Food, Drug, and Cosmetic Legislation.

It is announced that Dr. Grassick has completed the second volume of his History of Medicine in North Dakota. The book will furnish both interesting reading and valuable data. Some copies of the first volume are yet available, and can be purchased from the State Secretary at $2.25 postpaid.

Proposed Extinction of the Two-Years' Premedical Schools: Several months ago the Council A. M. A. voted that hereafter no classification be given to this type of medical school. The action aroused so much protest that later the sting was somewhat modified. Whether the action was brought about by the belief that those colleges were not of sufficiently high grade, or that possibly their elimination would be one means for the lessening of the number of students applying for admission to the medical profession, is a question to be settled from an exact knowledge of the facts. Dr. H. E. French, Dean of our School, and Dr. G. M. Williamson, Secretary, N. D. State Board of Medical Examiners, were appointed delegates to the February meeting in Chicago of certain sections of the A. M. A., and there they presented their arguments, about which we shall hope to get reports in this session. While Dr. French, as we understand him, appreciates the many compliments and the friendly letters sent him concerning the necessity and the value of his School, he believes that the principal work of the doctors and those of the laity interested in that institution, is to prove to our legislators the urgency and the wisdom of giving proper financial aid, for the proper equipment and the maintenance of that School.

From the Journal A. M. A., April 2, 1936, we note that at the conferences in Chicago above referred to, Dr. E. P. Lyon of Minneapolis waxed eloquent upon the subject of increased requirements for the medical career. Under the title of "Swans Sing Before They Die" he included the following contribution to the subject of the over-supply of medical students.

"The question of the overproduction of doctors is of the greatest importance. I contend that there are already too many doctors, even if they were properly distributed and even if their services were available to all people, neither of which contingencies is true, or likely to be true under American conditions. In many years at a Dean's desk, I have watched the increasing difficulty and discouragement experienced by young doctors in earning a living. To say that the same condition exists in every profession does not help the situation."

He then discusses the system effective in Sweden, which country sets the number of medical students that may be admitted yearly to the universities there.

Nationwide and National Radio Debate: "Resolved that the several states should enact legislation providing for a system of complete medical service available to all citizens at public expense."

These debates let loose a vast flood of oratory, and in addition thereto many tons of pamphlets, magazines and books. In the nationwide radio, Doctors Fishbein and Leland of the A. M. A. headquarters ably represented our profession. As to the relative value of the whole affair, time alone will tell.

Our Committee on Maternal Mortality: This is a new committee. For some years past the A. M. A. has vigorously fought legislation of the Shepard-Towner type; also Illinois Medical Association has been able to keep out of that State Federal appropriations, that might have been utilized for maternal and child welfare. But now that President Roosevelt's Social Security Bill has become a national law, the present problem for the medical societies to solve, under these changed conditions economically, is the expediency of cooperating in the procedure of that new bill and law, rather than permit the politicians and the laity to carry on the programme as outlined by President Roosevelt and the law.

Home or Endowment Fund for Indigent Doctors: Several years ago the A. M. A. sent out questionnaires requesting opinions as to the probable need of a national home for indigent physicians. Those were the golden years of financial and contented prosperity, else the respondents were either modest or too proud, or possibly some fibbed as to their income, because the oracles at our Chicago headquarters decided that the replies were against such a plan. Since then one of the eastern states has established a Home. Pennsylvania State Medical Society uses an endowment fund, the cash from which is allotted to recipients in their own domicile. Fraternal orders like the Masons have conflicting views as to the merits of the state home as compared with the direct payment of cash to the persons needing aid. We have an airmail letter from an eastern doctor, circularizing the profession in the different states, urging the necessity for a physicians' national retirement fund. Probably none of you believe in the fantastic Townsend Plan. If, therefore, dire poverty overtakes us we must look for aid to the social shelter promised by the New Deal and the County Poor House.

Realignment of Medical District: Request was received from Kotana Medical Society that its boundaries be defined and also that they be allowed a Councilor. We sent circular letters to the state officers, the Executive Committee, the Councilors, and to the Secretaries and Presidents of the different medical societies, explaining conditions and requesting their opinions upon the subject. Mention made by us that it was the opinion of some of the fellows that owing to improved highways now caused by the adoption of automobile travel, it might now be profitable to alter the districting, originally planned with regard to railroad routes. Concerning an additional councilor, please note that some of the other states having a medical membership of many thousands, have not more than ten districts nor more than ten councilors. The questionnaire was mailed with the object of having the subject considered locally and thoroughly, thus saving some time in debate at the annual meeting. Only a few replies received. Anticipating that the affair will be introduced at this session, President McCannel has kindly drawn up a tentative plan for such realignment.

During the past year, among the varied verbal and written castigations directed against your profession two topics were prominent, viz.:

1. Birth Control, and its procedure.
2. Voluntary Euthanasia—the so-called mercy killing of persons held to be incurable. A suggested plan, especially in England, for the legalization of such action.

The first subject certainly must date many centuries prior to the time of old Malthus. As for Euthanasia in Great Britain it has the support of such men as Lord Moynihan, scientist Julian Huxley, etc. In America it would seem as though an impetus has been given to the procedure from the fairly recent publication of the book by the late suicider Mrs. Charles Perkins Gilman. The reaction upon the public and many of the clergy has been varied and in some instances very bitter, indeed. So here we leave these problems with you.

Albert W. Skelsey, M.D.,
Secretary.

Dr. W. C. Fawcett of Starkweather moved that the report be accepted.

The motion was seconded by Dr. F. W. Fergusson of Kulm.

Dr. G. M. Williamson of Grand Forks suggested that inasmuch as there were some very practical suggestions contained in the report, it might be advisable to refer the report to a special committee.

Dr. Fawcett amended his motion to contain the suggestion made by Dr. Williamson. The second, Dr. Fergusson consented to such change. Said motion was duly put and carried unanimously. President McCannel stated that he would appoint the committee at a later time.

The President called for the report of the Chairman of the Council, Dr. L. B. Greene, Edgeley.

REPORT OF CHAIRMAN OF COUNCIL

No meeting of the Board of Councilors has been held since the meeting of the State Association last year, as all the business of the Council was transacted at that time, and no new business of sufficient importance came up during the succeeding months to warrant calling the Council together. The allocation of funds made last year to the various committees seems to have been sufficient as not all of the allocated monies were used.

This year, however, the situation may be considerably different as no one can foretell with any degree of certainty just what may come up. Another session of the State Legislature will be held and what will come out of it is problematical.

Our legislative committee is going to need the personal help of every member of the Society, if it is going to be successful in defeating or staving off legislation detrimental to the profession and to the public at large. So-called "state medicine" and eventual regimentation of the profession will undoubtedly be an issue and a campaign of education, especially of those citizens of our state who will be aspiring to positions as lawmakers. It is vitally essential that every physician should make it a point to see that every prospective legislator from his district is contacted and fully informed of all of the evils arising from such a system.

The "quacks" we will always have with us and we can be assured that they will spare no effort to get their particular brand of quackery clothed with the mantle of state legality.

Only untiring effort on our part is going to preserve the medical law of our state in as satisfactory a condition as it is today.

If we can ever hope for improvement we must retain what we already have.

Lee B. Greene, M.D.,
Chairman.

Dr. Greene moved the adoption of the report, which was seconded by Dr. Goss of Carrington. The motion was duly put and unanimously carried.

Dr. MacGregor: I would like to ask Dr. Greene what knowledge he has of those who are proposing to enact laws at the next session of Legislature.

Dr. Greene: I might state that the Legislative Committee in each year of the last three that the State Legislature has been in session has found the going considerably harder. We have had popping up for three separate sessions of the Legislature the naturopathic bill. At the last session of the legislature there were at least two bills introduced that followed along the line of state medicine. The fact that those bills did not come out for an individual vote was due in a great part to the efforts of the Legislative committee and their friends.

I think you will have the report of the Legislative Committee, and while I haven't seen it, I imagine it will be somewhat illuminating along that line.

The motion was duly put and carried approving the report of the chairman of the Council.

Dr. W. W. Wood presented the annual report of the treasurer, which was referred to the Auditing Committee, on motion of Dr. Ramstad. Dr. Williamson seconded the motion which was duly put and carried.

REPORTS OF COUNCILORS

First District

Since the last meeting of the North Dakota State Medical Association the Cass County Medical Society has held seven meetings, with an average attendance of 34.

Two new members have been added to the Society and one has been lost by removal from the district. The paid membership of even date is 61.

Officers for 1936:

President: Dr. A. M. Limburg.

Vice-president: Dr. J. C. Swanson.

Secretary-Treasurer: Dr. E. M. Watson.

Delegates to State Society: Dr. T. H. Lewis; Dr. R. E. Pray; Dr. Wm. F. Baillie, Alternate; Dr. H. B. Huntley, Alternate.

Councilor: Dr. M. MacGregor.

Censors: Dr. J. F. Hanna, three years; Dr. M. MacGregor, two years; Dr. R. E. Weible, one year.

The programs during the year were about equally divided between the discussion of scientific subjects and topics of business interests.

Ileitis, parathyroid tumors, modern methods of controlling tuberculosis, safer motherhood, puerperal infection, diabetes a statistical study, cancer of the digestive system, and a report of the meeting of the American College of Physicians' Detroit session, were the topics of the year. Some of the subjects were presented by visiting speakers and the others were presented by the various members of the Society. A great deal of interest was attached to each one of these meetings. One topic of special interest was presented by a member of the State Association Committee on Public Relations, Dr. F. I. Darrow. His subject was "Public Relations."

Resolutions adopted during the year were directed toward the endorsement of the following activities:

The Fargo and Cass County Maternal Health League of Fargo.
The Maternal Health League of Bismarck.
The American Birth Control League.
The Diversion of Christmas Seal funds to the Furthering of case Findings and Isolation of Open Case Work in Tuberculosis.

A committee from the Society has kept up active contact with the City Health Department of Fargo and most of the problems touching both groups have been adjusted. Through these contacts a friendly and reasonable approach has been used in the solution of the misunderstandings which have arisen from time to time. This committee has been empowered to continue its work throughout the coming year.

The Cass County Welfare Board, in its management of the medical care of the indigents of Fargo, continues to do business in the same old way. Two physicians of Fargo are employed by the Board to furnish medical and surgical care to the indigent population of the City of Fargo. One of these is a member of the Society and the other is a non-member. It is to be mentioned here that the Society placed itself definitely on record more than a year ago, by resolution, that "no member of the profession of Cass County would enter into any salary contract with the Cass County Board for the care of the county poor after their existing contracts had expired."

A committee has been in constant contact with the Welfare Board throughout the past year, however, and has succeeded in gaining some slight concession from the Board. This relates to the care of the poor *outside* of the City of Fargo. At a meeting of the County Welfare Board, April 8, 1936, it was decided to provide medical care to relieve clients outside the City of Fargo on an individual fee basis instead of the county doctor system. This does not include hospitalization other than at the county hospital where surgery will be done by the regularly employed county surgeon in the usual manner.

Murdoch MacGregor, M.D.,
Councilor.

Second District

The Devils Lake District Medical Society held three meetings during the year and had visiting speakers at two of these. Our meetings were all well attended and it seems members are showing more interest than formerly. Our membership remains the same as we have taken in two new members, lost one by death, and one by non-payment of dues. Our membership is 28; non-membership, 12; most of these probably belong to more convenient societies.

G. F. Drew, M.D.,
Councilor.

Third District

There were seven meetings of the Grand Forks District Medical Society during the past year; activities are suspended during the summer months.

The first meeting, as has been the custom for a number of years, was held in Grafton. This meeting was largely attended and a discussion of fractures of the forearm and elbow by Drs. Galloway & McKinnon, Winnipeg, was practical, instructive and interesting.

Guest speakers from Rochester, Minneapolis, and Minot furnished the program for other meetings. The State Committee on Maternal Welfare had charge of the March meeting, presenting different phases of this subject in an interesting manner.

The Society lost by death two of its outstanding members, Drs. H. H. Healy and H. G. Woutat, both strong men who stood for the best in medicine. Our Society will miss their timely advice and counsel.

We have 57 members and a few others in the District who from indifference or reasons best known to themselves remain on the outside.

G. M. Williamson, M.D.,
Councilor.

Fourth District

Number of members in good standing.......... 55
Number of members suspended for non-payment of dues.................................... 4
Number of new members...................... 6

One application for membership was rejected.

The following members were lost to the Society by a change of residence:

Dr. F. D. Hurd, Tolley, who moved to Minneapolis, Minn.

Dr. Russell Gates, Minot, who moved to Santa Barbara, Cal.

Dr. K. F. Bascom, Minot, who moved to Manhattan, Kas.

Dr. C. O. Hanson, Minot, who moved to Minneapolis, Minn.

Dr. C. W. Robertson, Minot, who moved to Jamestown, N. D.

There were three deaths:

Dr. A. E. Pierce, Minot.
Dr. O. S. Leedahl, Stanley.
Dr. Geo. Durnin, Bottineau.

There were seven scientific meetings and four social meetings during the year.

The average attendance at these meetings was 26.

At the October meeting, Dr. W. D. White of Minneapolis presented a paper on fractures, and at the March meeting Dr. G. Alfred Dodds of San Haven gave an illustrated talk on the "Use and Results of Lung Collapse Therapy." Members of the society furnished material for the other scientific meetings. The society is alive and active, with all members showing interest and attending meetings whenever possible.

E. M. Ransom, M.D.,
Councilor.

(Dr. A. R. Sorenson of Minot read the foregoing report in the absence of Dr. Ransom.)

Fifth District

The Traill-Steele County Society has a membership of 13.

Three meetings have been held with an average attendance of seven members, with five visiting doctors at these meetings.

The following subjects have been discussed in the scientific sessions—Carcinoma of Cervix; Fractures; and an Orthopedic Clinic was held, the cases being from Traill County.

Dr. M. T. Savre of Northwood is president; Dr. Syver Vinje, Hillsboro, is Secretary-Treasurer; Dr. R. C. Little of Mayville is the delegate, with Dr. A. Kjelland, Hatton, as alternate delegate.

In the Sheyenne Valley Medical Society fifteen doctors hold membership, there being one eligible man outside the society.

A great loss to our group was sustained in the passing of Dr. W. B. Wanner, long a member and a man of sterling qualities.

Five meetings have been held, efforts at adjustment with our county commissioners holding prominence, together with autopsy findings as subjects of discussions.

Many of our men attended a meeting of the Stutsman County Society upon invitation extended.

Dr. Fred Brown is serving as president; Dr. Will H. Moore as Secretary-Treasurer; Dr. A. W. McDonald is the delegate with Dr. C. J. Meredith the alternate.

F. L. Wicks, M.D.,
Councilor.

Sixth District

The past year has been a satisfactory one for the Sixth District Medical Society.

The paid up membership is 57.

New members admitted to the Society are: Drs. Willis B. Shepard of Linton and Dr. R. B. Radl of Bismarck, who transferred his membership from the Southwestern District Society.

Dr. R. H. Leavitt of Carson has left the state and is now located in California.

Five regular meetings with an average attendance of 36 were held during the year.

The speakers from outside our district during the year were Dr. K. E. Miller of the U. S. Public Health Service and Dr. McCowan of the U. S. Children's Bureau.

In January, Dr. J. C. McCartney of the University of Minnesota gave us an excellent paper on "Pulmonary Embolism."

The April program was given over to the State Committee on Maternal Welfare and instructive papers were given us by Drs. J. H. Moore of Grand Forks, whose subject was "Safer Motherhood"; Dr. E. M. Ransom of Minot spoke on the "Toxemias of Pregnancy," and Dr. P. W. Freise of Bismarck presented a paper on the "Maternal Mortality Rate in North Dakota." At the meeting we were honored by the presence of our state President, Dr. A. D. McCannel of Minot.

The present officers are: Dr. L. G. Eastman of Hazen, President; Dr. G. M. Constans of Bismarck, Vice-president; Dr. L. W. Larson of Bismarck, Secretary-Treasurer.

The difficult economic situation has been met by the splendid co-operation of the physicians in our district with one or two exceptions. The plan recommended by the State Economic Committee has been a great aid in preventing economic chaos among physicians and in maintaining the traditional professional relationship between physician and patient.

N. O. Ramstad, M.D.,
Councilor.

Seventh District

Your Councilor begs leave to report the activities and status of Stutsman County Society for the year ending May, 1936.

Two members were lost during the year, Dr. Winn moving to the sunny South; Dr. Helena K. Wink passing to the Great Beyond, her lamentable death being caused by burns following a gasoline explosion. In the passing of this very wonderful woman, whose philanthropy and many personal sacrifices extending over a period of more than fifty years' practice, have left an enviable mark for us to strive for and in a small way possibly emulate.

Seven new members have been added to our roll, making a total of twenty active and paid members. Two men remain out of the Society, both just careless.

Four regularly scheduled meetings during the year, at three of these outside physicians presented very interesting papers, with considerable discussion at each meeting. Aside from these, several other meetings were held, at which time matters of a business nature, problems dealing with local and state economic conditions were discussed. Our Society stands firmly united on the program presented by the Medical Economics Committee.

A friendly gesture, in line with the thought of decreasing the number of small practically non-functioning medical societies, by the coalition of two or more existing groups into a larger well organized and interesting Society, was brought to Stutsman County by the Southern Medical District, who are assisting morally and financially in making this present meeting of the State Society possible, and we hope successful.

P. G. Arzt, M.D.,
Councilor.

Eighth District

Members of the Southern District Medical Society have held several informal meetings during the past year. As the Society is located in a district having no important medical centers, but comprises several counties in area, it is difficult to secure a very large attendance at meetings and no scientific programs were attempted the past year, the members merely gathering together and spending the time discussing subjects of interest. Needless to say the subject most widely discussed has been the relations of the medical men with the Welfare Board of the several counties. The complete dissatisfaction expressed is illuminating to say the least and serves to emphasize to the profession the dangers to be encountered in the rapid advancement of the policies of "State Medicine."

Our last meeting was held at LaMoure in April and was quite well attended. One new member was admitted into the Society and an entirely new set of officers were elected for the ensuing year. Arrangements were initiated for the holding of a scientific program by the Society at one of the larger towns in our area during the month of July.

Lee B. Greene, M.D.,
Councilor.

Ninth District

For the year 1935 we have had in the Tri-County Society four meetings: January 4, 1935; May 9, 1935; Oct. 26, 1935; and Dec. 6, 1935. All meetings were held at Fessenden except Oct. 26, which was held at Harvey. On Jan. 4 was held election of officers. On May 9 there was a clinic held by Dr. Swanson of Fargo on paralysis and fractures, five clinical cases reviewed and demonstrated, with patients present, thanks to Dr. D. W. Matthaei. On Oct. 26, 1935, a review of clinical cases and discussion of Medical Economics. On Dec. 26, 1935, election of officers for 1936. Motion made and seconded that county work be done on the same fee schedule as adopted for welfare work.

April 29, 1936, meeting held at Fessenden. At this meeting the Tri-county Medical Society went on record as:

1. Being in favor of retaining the Medical School at University of North Dakota.

2. That monies received on sale of Christmas seals be used for T. B. work only.

3. Being in favor of redistricting State Medical Societies.

All of which I most respectfully submit for your consideration.

E. L Goss, M.D.,
Councilor.

Tenth District

As Councilor for the Tenth District, I beg to submit the following report:

The Southwestern District Medical Society, in spite of bad weather conditions and snowbound highways, have held four meetings during the year. All of them were well attended except one of February 8th, at which time the roads were impassable, accounting for the fact that we only had twelve in attendance. At this meeting, we were very happy to have with us as a guest speaker Dr. H. F. Fortin who gave us a talk on "Fractures and Dislocations" generously illustrated by lantern slides and plates.

We have lost four members during the year as follows:

Dr. P. K. Dahl, formerly of Belfield, is now located at 826 Nicollet Avenue, Minneapolis, Minnesota.

Dr. T. Lemieux of Bowman has moved to Dunseith, N. D.

Dr. R. B. Radl of Dickinson is now located at Bismarck, N. D., and has become affiliated with the Sixth District.

Dr. Carl Voss of Hettinger, has moved to Europe.

Also, Dr. Frank Titzell of Beach, who by the way never belonged to our Society, has returned to Iowa, whence he came.

We have 26 paid-up members, including every eligible doctor in our district, which gives us 100 per cent membership for the third consecutive year.

At the last meeting of our Society, held May 6, 1936, at Dickinson, North Dakota, the following resolution was unanimously adopted:

Resolved, that the secretary of the Southwestern District Medical Society be instructed to write a letter to Dr. George Williamson expressing thanks and appreciation for his co-operation with the local doctors in the case of Drs. Johnson and Beherns, and for his prompt and efficient work in bringing to an end this medical racket in Beach, N. D.

Also, that a letter be sent to Dr. Garberson of Miles City expressing appreciation for the very fine cooperation received in this case from him and the Montana State Board of Medical Examiners.

Also, that this resolution be included in the Tenth District Councilor's report to the State Council and House of Delegates.

A. E. Spear, M.D.,
Councilor.

President McCannel appointed a committee consisting of the following, to wit: Drs. Ramstad, Hoeper, Long, Williamson and Sorenson, to go over the Councilors' reports and make their report to the next meeting of the House of Delegates.

On the Chairman of the Council, Dr. Greene's report, the following committee was named: Drs. Bowen, Stackhouse and Larson, said committee to report to the next meeting of the House of Delegates.

REPORTS OF COMMITTEES

Committee on Public Policy and Legislation

The report was read before the House of Delegates by Chairman, Dr. L. W. Larson, and duly accepted.

A discussion of said report ensued which was participated in by Dr. McCannel, Dr. Williamson, Dr. MacGregor, Dr. McLaughlin.

Committee on Hospitals

The chairman, Dr. V. J. LaRose, was not present. Drs. Pray and Sorenson stated there was no report to be made.

Committee on Medical History

Dr. Williamson: I haven't any particular report except to say that Dr. Grassick has left with me a manuscript which is practically sufficient for another volume to be published. It may not be necessary to do so at the present time, but it is available when we get ready, and I believe it would be a good plan to have it published. He compiled some of the manuscript a year ago and then some more this year. In Dr. Grassick, I think we have a most wonderful man

He is 85 years of age now; his mind is as keen as ever, as you men possibly know who have been fortunate enough to be on his list for receiving his little Christmas pamphlet or Xmas card, we will call it. They are real gems.

A month before he started for California last fall, he came in and presented this book. This is not exactly a history of medicine in North Dakota, but what has gone on in this Society for the past ten years. I think it was in 1926 that we published a volume, which was gotten together by Dr. Grassick from The Journal-Lancet, and which was also supplemented by some of his own writings. We have a complete volume here of the proceedings of this Society for ten years as taken from The Journal-Lancet. Dr. Grassick no doubt will not be with us ten years from now, but we can carry this along and then in ten years publish another volume. Dr. Grassick did this at his own expense. He gave it to me and I hope you will examine it before you go away. Of course, if we publish a history in North Dakota, there are a lot of things you wouldn't put into a book, but it is very interesting indeed, and it will be interesting for the secretary to keep a record that way; then as we go down through the ages we would always have more or less of a history of medicine in North Dakota. Dr. Grassick compiled this and put it out at his own expense. He spends his summers in his office doing things of this kind.

I do not have his address in California, but I think it would be a fine thing, if before this meeting closes, we send him a telegram. He is in his eighty-sixth year, and I think he would appreciate it very much, if we thank him for the work he has been doing for us. I have part of the work he compiled before he went away, and this is very splendid. I want you all to look at it before you leave.

Dr. McCannel: I think we are particularly fortunate to have this report. I think the telegram should be sent, and also that the Society should pass a Resolution to send him some complimentary message at this time while we are in session.

Dr. Fawcett: I move you, Mr. President, that the President and Secretary frame up such a telegram and send it immediately to Dr. Grassick in California.

The motion was seconded by Dr. Fergusson, duly put and unanimously carried.

(The following telegram was sent to Dr. Grassick: "The North Dakota State Medical Association in convention at Jamestown sends you its fraternal greetings and its appreciation of the valuable services rendered by you to it and to the public.")

Committee on Journal-Lancet

In the absence of the Chairman, Julius O. Arnson, Secretary Skelsey, read the report, as follows:

Regarding The Journal-Lancet: There is very little to report. Since the last state meeting The Journal-Lancet has been issued monthly and it is the opinion of the members of the committee that this innovation has resulted in an improvement in the magazine, at least, physically. That the innovation has met with approval seems to be evidenced by the lack of criticism from any source.

There is one deficiency in The Journal-Lancet which we believe should be remedied, and that is, it has been difficult to obtain editorials from members of the staff. There has been no response to our request, of a year ago, for various members in our component districts to communicate with us regarding matters to be discussed in the editorial pages.

In order to stimulate more local use of the pages of The Journal-Lancet, it is our suggestion that a Department for Case Reports be made available to the men in the society for the publication of interesting cases.

We believe that both of these measures, that is, the use of the editorial columns for the airing of the views of the profession, and the use of the Department for Case Reports, should be prominently called to the attention of the Society through the columns of The Journal-Lancet.

The relationship of the publication has been very pleasant and we have had no criticism called to our attention.

We recommend continuing the policies of the Society in regard to The Journal-Lancet as it exists at the present time.

Dr. Pray, Jr., moved the acceptance of the report, which was seconded by Dr. Wood. Motion duly put and unanimously carried.

Report of Committee on Cancer Survey

The following report was read by Dr. L. W. Larson, in the absence of Dr. E. P. Quain, chairman:

The Committee on Cancer adopted the same program for 1935-6, as had been in effect the two previous years. Each medical society was urged to conduct at least one symposium on the subject of cancer during the year, and it was suggested that cancer of the gastro-intestinal tract be discussed. Many societies have complied with this request. No attempt was made to further the educational program among the laity in the State by means of the radio, newspaper articles, or the distribution of pamphlets.

It is suggested that the Committee be continued and that its main objective be the education of the practicing physician so that he will recognize the early signs and symptons of malignancy and institute proper treatment.

Dr. Fergusson moved the adoption of the report, which motion was seconded by Dr. Pray. Said motion was duly put and unanimously carried.

Committee on Tuberculosis

Dr. Charles MacLachlan, Chairman of the Committee on Tuberculosis, made the following report:

Your committee on tuberculosis consisting of Dr. Williams, State Health Officer, Dr. Arnson of Bismarck, Dr. Rowe of Minot, Dr. Toomey of Devils Lake, and the speaker, held two meetings within the year. The third meeting was called at San Haven. The first one was held at San Haven; the second was called at San Haven and one of the members not being present, and feeling it was an important meeting, it was adjourned until today to meet at three o'clock this afternoon. Three of the members of the committee were here and the fourth appeared before the hour expired, and we met in the dining room of the hotel. Fortunately we had with us Dr. Coventon of the Rockefeller Foundation. He has not yet visited the institution but promises to within a few days.

This report, presented as it is, is in two parts. You may consider it lengthy, but the subject is one that requires considerable time, and I think should have the attention of the State Medical Association. I am first reading the sanitorium section.

Pronounced shortage of infirmary bed accommodation for adults is still the crying need of this institution. While in January, 1935, there were 107 applicants who could not be admitted because of this shortage, there are now 186 such left in their homes to spread the infection, notwithstanding that within the year internal infirmary changes in bed space cared for 30 more bed patients.

Patients admitted and cared for May 1, 1934 to May 1, 1935	174
Patients admitted and cared for May 1, 1935 to May 1, 1936	193
Adult males admitted May 1, 1935 to May 1, 1936	72
Adult females admitted May 1, 1935 to May 1, 1936	78
Child contacts admitted May 1, 1935 to May 1, 1936	43
Total	193
Patients discharged May 1, 1935 to May 1, 1936	136
Adult males discharged May 1, 1935 to May 1, 1936	36
Adult females discharged May 1, 1935 to May 1, 1936	54
Children discharged May 1, 1935 to May 1, 1936.	46
Total	136

Of the 72 adult males admitted, 28 were far advanced cases.

Of the 78 adult females admitted, 33 were far advanced cases.

Of the 46 children admitted, three were bone and joint cases.

Patients accepting pneumothorax May 1, 1935 to May 1, 1936	143
Number of air fillings administered same period	5210
Number of oil fillings administered same period	8
Cases tried and failing to accept pneumothorax	18
Cases given phrenic nerve surgery	20
Thoracoplasties performed since June 27, 1935:	
First stage	12
Second stage	9
Third stage	2
Pleuritic adhesion cases relieved by pneumolysis same period	19
Other surgical operations performed at San Haven	44
Examination of out patients during same period	192
Plates of outside cases interpreted and reported upon May 1, 1935 to May 1, 1936	334

Sixteen patients-applicants died awaiting admission.

This fact significantly condemns North Dakota's anti-tuberculosis policy of waiting until the presence of the disease becomes manifest to the patient by which time it is usually a far advanced case with lung cavitation, defying control and arrest except after years of bed rest and the employment of radical chest surgery rendering him physically incompetent to return to his former line of service and therefore requiring charitable maintenance.

A year and a half ago San Haven had sixty-six patients considered incurable unless radical chest surgery could be furnished to give relief, in a large group of these. County officials in most cases balked at engaging to spend the $350 to $600 required for each of these, for rail or ambulance transport, and accompanying nurse, the surgical fee after treatment, hospitalization and return of the patient following six weeks of treatment elsewhere, and preferred to go on paying monthly maintenance requirements.

Facing a problem requiring the use of sixty-six beds for patients to whom their counties would not extend radical surgical relief elsewhere while upwards of one hundred patients were pleading for admittance, we were forced as an institution to acquire an experienced chest surgeon in order that a selected group of these 68 might be given at their request the only hope of arrest offered.

The institution's reputation was at stake in adopting this advanced step, thus jeopardizing its mortality percentage, and we sought for state surgical staff conferees of known reputation, adding without salary a reputable surgeon and an orthopedist. The result has been most gratifying and the otherwise incurable list has been considerably reduced with only one fatality among those operated, as above listed.

It is true we are fighting aggressively at the State Sanatorium to overcome the enemy's ravages in its last stage victims, but the attack should have been begun months before they came into our care. The aggressive campaign should and must begin at the earliest possible moment of the attack and we doctors all know the bug must be earnestly sought for in the school and in the home, and found while it can still be overcome with little or no remaining disability and in a few months' Sanatorium care.

If the cases were sought for and discovered early (as they can be under known tests) and properly cared for, the present bed accommodation at San Haven, if given over to the care of these, would care for three times the number of cases in the same given time, and arrest and restore to service more than six times as many as the records today show.

Our women of the State Federated Clubs, should they become really conscious of the tuberculosis situation, could, if they would, kindle such a destructive fire over, under, and around this destroyer of the home, as would not become extinguished until an infected case would in 25 years be a rarity. They, the press, local boards of health, the practicing physicians and the county nurses, with literature supplied by the National Association, and with Christmas seal monies, could arouse every infected community in the state to a point where the concerted action would deal it a knock-out blow.

Why not take a leaf from the experience of our neighbors east and north, Minnesota and Manitoba, where they have recognized the necessity of seaking for and finding every case early, examining and protecting every contact under the realization that every case comes from another?

I shall now report on the committee section:

Notwithstanding the well founded observations and deductions of Dr. William Budd, physician to the Royal Infirmary, Bristol, England, who in 1856 first indicated that Tuberculosis should be classified as a contagious disease, and that Robert Koch, German bacteriologist, in 1882 found the bacillus proving Dr. Budd's contention as to its contagious nature, our North Dakota intelligentsia 80 years later have not yet become fully awake to its significance in dealing with the disease.

Were our citizens tuberculosis conscious and fully aroused to the possibilities of its being conquered and eventually exterminated, we, your committee, would not be called upon to confess that the records show there are today 186 tuberculosis afflicted applicants in North Dakota seeking care at the State Sanatorium which is denied them because building accommodation and beds are not available at San Haven or elsewhere in North Dakota.

What a travesty this is on our nationally proclaimed intelligence when we are obliged to acknowledge our callous indifference to and shameful disregard of the employment of the God-given opportunities within our knowledge and grasp to bring relief to our tuberculous. We refer to the Mantoux test and X-ray as the G men in this life-saving agency.

The financial depression and the inability to raise money by taxation to provide Sanatorium shelter, beds, nursing and medical care for our tuberculosis afflicted, is a worn-out excuse for our state's delinquency. Our response to the call was unheeded when the state was prosperous. Instead of giving heed to the call of humanity as a state we directed our attention and money investments into business ventures of doubtful benefit to the public, and allowed our poor but intelligent citizens to go uncared for, spreading infection to other members of the family in the home and neighborhood, thus assuming later financial obligations for their care when they too could be admitted to protracted Sanatorium care.

Minnesota's farsightedness in providing sanatorium bed care for its tuberculous has been a blessing to North Dakota, for San Haven has frequently found patient accommodation at Sunny Rest, Crookston; at Battle Lake, and elsewhere in Minnesota Sanatoria for a North Dakota pay patient applicant whose date of application placed him far down on our San Haven waiting list. He was thus given immediate bed rest and sanatorium care, while otherwise he would be obliged to wait four to six months at home infecting those about him, mortgaging their physical future and the state's treasury for their later care. The reason for this scattering and occasional single bed accommodation in *Minnesota:* Their legislature, recognizing a deadly enemy within their borders whose mortality dealings could be wiped out, provided for its citizens three and one-half beds to North Dakota's one pro rata as to population. Manitoba's forethought and care of the tuberculous is on a par with Minnesota's intelligent dealing with the enemy. With less population they have 725 beds for the tuberculous to North Dakota's 297.

Another appalling fact, and a disgrace to our intelligence follows: Fifteen patients making application for a bed at San Haven within the past year have died in their homes awaiting admission. Two on our completed list after months of waiting, died within five days of their admission at San Haven and among strangers. True, it is that partially aroused to the obligation resting upon them, our recent Legislature, co-operating with the Federal Government, is now erecting a fine infirmary 123 bed unit at San Haven. This when fully equipped, however, will not care for the present registered list of applicants, the majority of whom are far advanced cases.

Here follows another of our inhuman shortcomings: Why should we allow our tuberculous afflicted become far advanced cases requiring years of Sanatorium care and consequent expense to the taxpayer, when science has placed in our hands the means of finding the afflicted in the minimal stage, in which a few months of institutional care will arrest the disease and allow the patient to again become self supporting?

We cannot excuse ourselves for failing to seek suspected cases early and thus definitely determining their active or their non-infective standing in the home, and so care for them.

The National Tuberculosis Association is constantly sloganing to the public, "Every case comes from another"; "Examine and protect every contact." Why not heed their call when we who know the disease requires to be sought for and found in the early stages that "arrest" may be assured? Why shirk our responsibility as protectors of the public health against a stealthy and deadly enemy, lurking hiddenly, and dealing death blows to our people?

Why spend public monies collected for tuberculosis extinction in a faltering opposition and in half-way meaningless projects? Why not give proof for the faith that is in us and to the seriousness of the situation that confronts our people, and discard some of the costly but half-hearted methods now in vogue?

We, as your Committee, earnestly implore this organization to meet up with its obligations for public safety by respectfully memorializing our state Administration, our Governor, our legislature, not to fail in their humane obligations to our tuberculous afflicted, and at its next session to provide means to seek for the masked foe tuberculosis, first in the most foully infected well known areas and reaching out with a determined purpose to cover the state within the next few years; provide in the next five years double our state's present infirmary capacity and thus close a death grip on the life-destroying enemy's under-cover methods, and call upon the state's anti-tuberculosis organization to co-operate fully in our campaign.

Would a ship's crew spend time, effort and money on caulking a small leak while the ship's hull is stove in and the passengers' lives are at stake? We appeal to the intelligence and fair-mindedness of the N. D. A. T. Association for co-operation of effort to meet the emergency, to bring into play all its resources, to meet the enemy's front line of attack; to assist in devising means to seek it where it lies armed and in hiding.

We are convinced that such well-directed effort would uncover in our state more than twice the number now in the state sanatorium, including the 186 known cases now seeking vainly to be given deserving care. Further, for humane and economic reasons, we are of the unanimous opinion that under supervision of the State Health Department the fight against tuberculosis should be centralized in the State Sanatorium; that the Sanatorium capacity should be further increased, and that promptly, to meet the demand made upon it through a well equipped field unit's services, in finding active but as yet undiscovered cases and extending them appropriate institutional treatment. Cottage care is expensive. The institution has now sufficient cottage space to care for its exercise patients should infirmary accommodation be increased to twice its present capacity at San Haven.

Legislative provision should be made for the State Sanatorium to be provided with a social service employe. Also for the introduction of a department of occupational therapy, and for an increase in the medical staff of at least two additional members to care for the reception in September next of 123 more patients. The institution is now understaffed but is rendering excellent up-to-date service, including that of all phases of chest surgery.

We appeal to this organization to sponsor the above outlined humane policy through its Legislative Committee, and with the co-operation of such agencies as the State Press, the N. D. A. T. Association, the State Health Association, Federated Womens Clubs, Health Welfare and Fraternal organizations and local boards of health.

All of which your committee presents for your most serious consideration, approval and action.

At a meeting of the committee on tuberculosis held this afternoon, Dr. MacLachlan presented his report for discussion, and the following recommendations and resolutions were drawn up for the action of the State Society:

Dr. Williams moved that the present activities of the anti-tuberculosis campaign, i. e., the seeking of contacts through the activities of the state health officer with the co-operation of the profession be continued. The motion was seconded by Dr. Arnson and carried.

It was moved by Dr. Arnson and seconded by Dr. Williams that the present committee of the state society be increased in number to include interested physicians more widely disseminated through the state, the size and personnel of the committee to be decided by the president of the state society in conference with the present committee; however, this committee shall include the state health officer, the superintendent of the sanitorium, and the president of the anti-tuberculosis association. It shall be the function of the committee to formulate plans for the dissemination of information regarding tuberculosis by means of the press, radio, public meetings, etc.

Dr. MacLachlan moved the adoption of the report, which was seconded by Dr. Benson.

Dr. Sorenson: I think this report is of sufficient importance that it should be referred to a committee. I think this report is one of the most splendid accounts we have ever had, and it would be well if it were printed and sent to every doctor in the state, that he might be a center of contact, and to aid him in being a contact with his community. Those of you who live farthest from Dunseith possibly do not realize the high state of efficiency to which this institution has now come under Dr. MacLachlan's supervision. It has grown to be a first rate sanatorium, and with the addition of Dr. Dodds as medical adviser, who is a top man in his line, I can assure you that the patients receive the best possible care. I think we should commend Dr. MacLachlan and his assistants on the work they are doing there.

I would also like to state that I believe we went on record as favoring the proposition of using all of the funds received in this state through the sale of seals and other things for the direct care of the tuberculous and not for any other purpose. I think because of the lack of money through the executive or legislative means, this additional revenue would aid greatly, and probably establish traveling units that would be going about the state discovering early cases, as is being done in Minnesota and Manitoba. I think when that is done the sooner we will be able to do something to meet the problem of tuberculosis.

Dr. McCannel: Shall we defer this to the committee on Councilor's reports for their consideration?

Dr. Williamson: This is a subject of very great importance. Don't you think we should have a special committee? There are other fellows who would be very glad to work on a committee of that kind.

Dr. McCannel: First, I think we better dispose of Dr. MacLachlan's motion. It was seconded by Dr. Benson, I believe. (Motion duly put and carried.)

Dr. Williamson: Now I will make a motion that this report be referred to a special committee. Dr. Fawcett seconded the motion, which was duly put and carried.

Committee on Military Affairs

Dr. Lee B. Greene, chairman of the Committee on Military Affairs, read the following report:

The Committee on Military Affairs continues to urge young physicians to make application for commission in the Medical Reserve Corps and complete the necessary correspondence courses.

The committee urges upon all members to combat in every way possible all organizations engaged in undermining the National Defense, to not be led astray by the so-called "Peace" Propagandists whose ultimate objective is the overthrow of our form of government. All movements to abolish compulsory military training at the State University and State College should be vigorously opposed.

The committee is heartily in accord with the project to construct armories to house all the Units of the North Dakota National Guard and hereby urges Congress to make the necessary allocation of funds requested by the Militia Bureau that this project may be carried through in all of the states.

Dr. Greene moved the adoption of the report, which was seconded by Dr. Goss. Said motion was duly put and unanimously carried.

Committee on Fractures

Dr. A. L. Cameron, Chairman, stated there was no formal report; however, he made the following comments:

There is a meeting tomorrow which has been announced on the program. It has been our policy in the past year to have each Society put on a fracture program during the year. I notice in the Councilors' reports, that has been done in a large measure. We are simply in the initial stages of organizing this work. We hope to accomplish more next year.

Dr. McCannel: There are three committees that I would like to recommend at this time, of which I make mention in my address to the Society. In view of the fact that the Social Security Act is now a reality, we as the medical profession have certain obligations to carry it out, and it is up to us to try to control the program rather than to oppose it. It is an act of Congress; it is here; and I think the attitude of the profession should be to get in and try to control the work in conjunction with those who have the administration of these particular activities. I refer particularly to the one on Maternal and Child Welfare. It was called to my attention sometime last fall by Dr. Moore of Grand Forks, so I took the liberty of appointing a Committee on Maternal and Child Welfare. That committee has done outstanding work this year and it shows what a committee can do if they are interested in a subject and get out and work. There is a particular allocation of funds for this work and Dr. Williams is very glad to work with this Society and she will speak to the Society on that particular phase of the Social Security work. That is my reason for appointing this committee.

There is another question coming up, the question of crippled children. That is now being taken care of by the Masons, the D. A. R., the Elks and different women's organizations. All the funds coming from the national government must clear through one agency which can speak for the entire committee structure of the state. At our meeting yesterday, it looked as though the Public Welfare Board will have to administer these funds. With that thought in view, I think there should be a standing committee of the Society, of men especially interested in crippled children, who can speak with authority and co-operate with existing agencies who are administering that fund, which we hope will be allocated to North Dakota. Those two committees, together with the Fracture Committee of the American College of Surgeons, I think should be made permanent standing committees of the North Dakota State Association so they may speak with authority for this group.

Now then there is one other committee I think I should mention here. That is the committee on Scientific Program. We have been looking over the by-laws and we find that in the by-laws in Section Two there has been a scientific committee of the State Association, consisting of the President, Secretary, and three members appointed by the President from the local Society where the annual meeting is to be held. That has been carried out in part. The President and Secretary do not have very much to do in the last few years and it practically resolves itself into this—the city which entertains the Society goes ahead and builds a program, and in building that program, use their own judgment without any correlation with the State Society. I feel that the same plan that has been worked out in Minnesota of having a scientific committee consisting of the president and secretary, and then a committee of three or five more representing medicine, surgery and possibly a couple of specialists on that committee, and then—not because I am retiring president—I think the retiring president could be of immense value on the committee on scientific program. He has been through the mill, knows what some of the mechanics are. I believe that we should not, the minute a man has finished serving as president of the Association, drop him and not make further use of his ability and experience obtained by tenure of office. I think the retired president should automatically become a member of the Scientific Committee consisting of three, five or more; then the local society or local group who are entertaining the Association can take care of the mechanical arrangements of the program. In that way we can probably get better balanced programs. I think we have had wonderful programs the past few years but I believe we could balance them even better, and possibly look forward to a program four or five years rather than from year to year.

In that connection, too, I would like to raise a question with reference to building a program. I feel that we have been rather derelict in not calling on members of our state society to provide material for our programs. We have probably depended entirely too much on outside help, and I think it is more or less of a reflection on the medical profession of North Dakota. I believe we should have at least fifty per cent of the papers from our state society members each year. It will help to develop our local men and I think it will add to the strength of the Society.

Those are the three committees, with the approval of the House of Delegates, that I would like to add to our standing committees.

Dr. Ramstad: I would like to move that the President be authorized to appoint a committee of three to consider these matters, to prepare the proper amendments to the by-laws, so that these recommendations may be properly brought before the House of Delegates. Dr. Drew seconded the motion which was duly put and carried.

Report of Committee on Public Health

1. The public health activities of the State of North Dakota for the past year may best be described under the various divisions of the public health field, viz., public health administration, sanitary engineering, communicable disease control, vital statistics, child hygiene and public health nursing, and public health laboratories.

A. Owing to lack of funds and personnel the activities of public health administration and communicable disease control in the State Health Department have had to be carried by the State Health Officer. The passing of the Social Security Act in August, 1935, and the availability of Social Security funds on February 1, 1936, have been responsible for much extra work, in submitting plans and budgets for North Dakota. It will be possible for the State Health Department to match all funds available from the United States Public Health Service, but will be unable to match the $32,000 available for North Dakota from the Children's Bureau for maternal and child hygiene because of lack of funds. The funds available are to be used in strengthening the State Health Department in epidemiology, including the control of tuberculosis and venereal diseases, in sanitary engineering, child hygiene, and public health nursing, in vital statistics and health education, and in aid to local communities for full time health work, either county or district. Only three counties in North Dakota seem to warrant full time county health departments, viz., Ward, Grand Forks, and Cass Counties. A population of at least 30,000 is desirable for a full time county unit unless economic conditions warrant organization for a smaller population.

2. On May 1, 1936, the United States Public Health Service detailed Dr. Frederick Kratz for one year to act as assistant to the State Health Officer, to assist in development of the public health activities in North Dakota, while the North Dakota physicians are being trained to fill the positions made possible through the additional Social Security funds.

3. An appraisal of the reporting of communicable diseases by physicians was made for the state for the year 1935. Comparisons are based on deaths for the past five years. This appraisal showed that reporting was good in measles, scarlet fever, whooping cough and diphtheria; poor in tuberculosis and typhoid and very poor in syphilis and gonorrhea.

4. The Rockefeller Foundation was invited to make a study of public health conditions and activities in North Dakota in January, 1936. The survey is being made by Dr. Platt W. Covington, western representative of the Foundation, and will be complete with recommendations in October.

5. Approval of plans for many Federal activities, such as Resettlement Administration, WPA, PWA, and the Federal Housing Administration are required from the State Health Department. This has taken much time.

6. A report of public health activities in North Dakota was prepared and presented to the State Planning Board. Much time and effort has been spent on preparing the material which has been requested by this Board.

7. The FERA nursing service was discontinued in August, 1935, and continued by the WPA in October, 1935, and 32 county boards of health are sponsoring public health nursing programs at the present time.

8. In 16 counties there are active Advisory Health Committees to the County Boards of Health who are meeting regularly, and are becoming interested in public health activities and are in turn interpreting the work of the medical profession and the public health workers to a larger group. Several counties have committees which are not as successful and which need all the encouragement which the local physicians can give them.

9. In 1935 there were almost 1,000 less births registered in North Dakota than in 1934. This decrease cannot be entirely explained by a natural decrease in births. An attempt has been made to locate the centers where registration is weak, since many counties did not have a decrease in 1935. The result has been that the registrars blame the physicians for not reporting all their births and the physicians blame the registrars for not forwarding the certificates to the Bureau of Vital Statistics.

10. Under Social Security there will be some fellowships available to North Dakota physicians wishing to make a career of public health in North Dakota. These fellowships for three and six months' periods are for physicians under 35 years of age, who will be on the staff of the State Health Department or will act as full time county or district health officers.

11. The North Dakota Health Officers Association is being held on May 18, with the following papers being offered and all medical men are asked to attend:

"Prophylaxis and Treatment of Communicable Diseases," L. W. Larson, M.D., Bismarck, N. D.

"Poliomyelitis To-date," W. E. G. Lancaster, M.D., Fargo, N. D.

"Posers in Birth Registration," Margaret D. Lang, B.S., State Health Department.

"Full-time Health Units," Fred W. Kratz, M.D., Director of Local Health Work, State Health Department.

"Public Health Conditions in North Dakota as Shown by a 1936 Survey," Platt W. Covington, M.D., Western

Representative of the Rockefeller Foundation, Salt Lake City, Utah.

"Venereal Disease Control," O. C. Wenger, Surgeon, U. S. P. H. S.

"Diagnosis, Treatment and Prognosis First Infection Tuberculosis," J. Arthur Myers, M.D., Minneapolis, Minn.

"Modern Trends in Obstetrics," Edwin F. Daily, M.D., Washington, D. C.

"Laboratory Assistance to Physicians," Melvin E. Koons, B.S., State Public Health Laboratory, Grand Forks, N. D.

12. The success of the public health program in North Dakota is due to a great extent to the sympathetic co-operation given by the medical profession of the State.

Respectfully submitted,
Maysil M. Williams, M.D.,
Chairman.

Dr. Williams also discussed informally the co-operative hospital and medical scheme in McKenzie County.

Dr. McCannel: We have a member of the Society here from out in the country where they are proposing this hospital, Dr. Hoeper.

Dr. Hoeper: My knowledge is second hand. Dr. Johnson from Watford City has told me about it. It is intended to put up a hospital costing at least $75,000, preferably $125,000, in a town of 800 people. It is proposed to run this hospital on the co-operative basis, provide a surgeon at the magnificent salary of $150 a month, and Dr. Johnson, the only physician in the town of Watford City, is for it. I would like to see a hospital down there; they could use it for a hotel after they got through with it. There is another similar one which is supposed to go into the Town of Wildrose, about 65 miles northeast, a town of, I believe, 600 people. Then the Farmers Union is talking about going into the co-operative hospital scheme at Williston, but there is nothing definite so far.

Committee on Care of Early Mental Cases

Dr. Carr, Chairman, reported as follows:

We have not met formally during the year. I have contacted each and every member of the committee. In September at the annual meeting of the State Bar Association, held in Grand Forks, I addressed them on the lunacy laws of the State. They agreed with my views and appointed a committee to work with our committee in the formulation of laws whereby any family physician could send a case where mentally upset to the hospital for observation; we to determine later as to whether or not they should be committed. Then the case could be treated and sent home without any charge of insanity against him whatever. That is the kind of law we hope to have framed, and one we hope will suit everybody.

Report of Examining Board

Dr. G. M. Williamson, Secretary of the North Dakota State Medical Examining Board, gave a résumé of the activities of the Board during the past year, and described the action taken by the Board, in conjunction with Counsel Judge Bronson, in bringing suits against some of the irregulars and the unethical physicians.

Committee on Medical Economics

Dr. H. A. Brandes, Chairman, gave the following report:

The past year has brought about a change in the administration of relief, including medical care, in our state. In December, 1935, the Public Welfare Board of North Dakota assumed responsibility for providing relief which had previously been administered by the FERA of North Dakota.

Under the act creating the Public Welfare Board, the administration and distribution of relief was transferred from the Board of County Commissioners to the County Welfare Board. This change in our laws governing relief was called to the attention of the officers of the component societies and to all physicians in the state in a circular letter sent out by your committee under date of December 19, 1935. In the letter we stated that the Public Welfare Board had recommended to the County Welfare Agencies the adoption of our Medical Relief Program and Fee Schedule, and that recommendation was of much assistance to our local medical relief committees in obtaining acceptance of our program in the following 35 counties:

Adams, Benson, Billings, Bowman, Burke, Burleigh, Dickey, Divide, Dunn, Eddy, Emmons, Foster, Golden Valley, Grant, Hettinger, Kidder, LaMoure, Logan, McHenry, McIntosh, McKenzie, McLean, Mercer, Morton, Mountrail, Oliver, Renville, Rolette, Sheridan, Sioux, Slope, Stark, Stutsman, Ward, Wells.

There are still thirteen counties in the state employing county physicians.

We have made progress during the past three years in our efforts to solve the problem of medical care for the indigent in our state, and we believe that with continued effort we may hope for state-wide acceptance of our relief program. Our medical relief program has been in force in a large number of counties for almost two and one-half years, and though it may have some faults we believe it is one which has proved to be of mutual advantage to patient, physician and taxpayer.

We would be neglectful of our duty to the members of the North Dakota State Medical Association if in this report we failed to sound a note of warning to the profession that our relief program is in danger. There is a small number of physicians who, in their efforts to increase their income, are taking advantage of the present relief set-up, thereby increasing the cost of medical relief and endangering our program.

We, as members of organized medicine, need to take steps to correct this situation in our own ranks lest the work of your state and local medical relief committees during the past three years be nullified.

The demands upon relief agencies are enormous and because of limited funds the Public Welfare Board is of necessity compelled to keep down the cost of medical and hospital care. Under the present regulations treatment is limited to acute or emergency conditions. If we keep this in mind when making our recommendations for treatment to the County Welfare Boards, we shall do much in conserving the taxpayers' money and to keep our program in force.

Corrective Care Program: The Corrective Care Program inaugurated on September 1, 1934, with funds supplied by the FERA of North Dakota was discontinued in August, 1935, because of the withdrawal of federal assistance. Under this project, which provided for correction of medical and dental defects in children under fourteen years of age, approximately twelve thousand children received treatment and about $130,000 was paid to the physicians and dentists.

It is difficult to estimate the benefits which these 12,000 children derived from the treatment provided them under the Corrective Care Program. Surely it was a worthy project and we believe that a like program should be undertaken by the Public Welfare Board when funds can be obtained for that purpose.

Revision of Fee Schedule: The present minimum fee schedule has been in force since November, 1933, and, though it has served its purpose fairly well, should be revised in the near future. One supplemental fee list was issued in March, 1935, but the schedule is still incomplete. We would recommend that under the headings of "Minor and Major Operations" the various surgical procedures be listed in detail and that fees for X-ray and radium therapy be added to the schedule. It is our recommendation that the incoming committee undertake the revision at an early date.

Social Security Act: In the Federal Social Security Act are several sections which carry large appropriations for improving the health of our nation. Nearly twenty million dollars a year will be expended through the public health service and the children's bureau for maternal and child health, crippled children, and public health activities.

We understand that when our state's share of these federal funds are made available the state health department and the public welfare board will be charged with carrying out the various health activities provided for in the act.

Numerous and perhaps serious problems will confront our profession as this recently enacted social legislation is put into effect. We shall be called upon in the near future to take our place in this new movement, and how shall we respond? It seems to us that we as physicians must show a willingness to co-operate in making reasonable changes, or face the possibility of the slow advance of state medicine.

The expenditures of your committee for the year were $52.15. We are submitting herewith an itemized list of our expenses. All bills have been paid by the chairman of the committee. We wish to express our sincere thanks to our president, A. D. McCannel, and to the officers and members of the local medical relief committees of component societies for the valuable assistance they have given us during the year.

Expenditures for 1935-36:

Dec. 1, 1935—Bismarck Tribune, envelopes and letter heads	$ 9.95
Dec. 19, 1935—Bismarck Reminder, mimeographing	18.00
Dec. 19, 1935—Postage	13.20
Dec. 19, 1935—Mrs. S. Arman, stenographic fees	11.00
Total	$52.15

Dr. McCannel: This report will go to the Finance Committee.

In regard to the point that Dr. Brandes has emphasized here with reference to the co-operation of the medical profession, I will say, as a member of the Welfare Board, we had quite a time in getting it over with the Welfare Board to get them to recommend it to the County Welfare Boards.

We have had all kinds of hearings—the chiropractic association has been before us twice trying to break down the rules. We have had osteopaths, opticians and others who do not belong to the medical profession, attempting to participate in the program.

I realize, and every one of you realizes, that we are not getting enough for our medical work for the indigent poor. We have a very good set-up and we want to go a little further than that, but the condition of the counties in North Dakota is of considerable interest. It was an eye opener to me—practically 40 per cent of the counties in the state cannot levy enough let alone collect enough taxes, to take care of their expenses. One county has 4,900 people and since 1929, since the cut in valuation, all they can levy is $68,800 and it costs them $101,000. That is true not only of that county, but it is true of about 40 per cent of the other counties in North Dakota; which brings up another angle which is not within our jurisdiction, that is, the consolidation of two or more of these smaller counties. We have counties up in our northwestern part of the state, i. e., Burke, Divide, Rolette, where they cannot levy enough, let alone collect it, to pay the overhead expenses. With that thought in mind, you want to realize we cannot criticize the county commissioners, nor can we criticize the county welfare boards, because at the present time, since the first of the year the State Welfare Board have been supplementing for relief in practically every county, in most of the counties on the 25-75 per cent basis; that is the county is only paying 25c relief and the State Welfare Board is paying the rest. The sales tax brings in some of it, but in the month of February, we allocated $225,000 to different counties; in the month of March, $225,000; last month we allocated $160,000. That fund is allocated on the basis of 25-75. This month we have to cut the allocation of all funds to around $50,000 in all of the counties of the state, because a decided load has been thrown on the welfare Board through the non-functioning of other relief set-ups. In other words, the month of February 55 per cent of the load we had to spend was for work that was not really the province of the State Welfare Board at all, but supposed to be taken care of by other relief organizations. Next month it was 45 per cent. Some supplemental medical care is given to WPA workers.

There is no way the State Welfare Board can get funds until the next legislature meets and get more out of the sales tax. I want you not to be too critical of the Welfare Boards in your counties, and the State Welfare Board. We are trying to meet the emergency, keep our heads and work along, and I know you will get the full co-operation of the State Welfare Board. Every man appears in sympathy with our program and we can work together. There are 53 counties under this plan. I think when we get a few statistics, we can prove to them it is an economical plan, let alone being a fair plan to the clients.

We had a meeting of the executive counsel in March at Bismarck and at that time the question of redistricting the medical societies in the state was brought up. We have in the state 13 districts and some of these districts have not been functioning. For instance, you have had a run-over of districts. Here are two counties, Williams and McKenzie who are part of the Kotana Society, which originally was the Society of Montana and Dakota, but the American Medical Association would not recognize it as a society taking in two states. These two counties are out here, a small society, I think about 12 men. There are only two medical men in McKenzie County, the rest of the men are practically all in Williams, about eight or nine in Williston.

Here is another county down here, Wapheton and Richland County, and then we have three or four counties, Dickey, McIntosh, Sargeant and LaMoure.

Now the re-organization plan we have suggested will take in all of the counties and make eight districts in the state. We must realize you can not have a strong society with eight or nine or twelve men spread over a number of counties. We have strengthened our society out at Dickinson taking in the whole group of counties, and with the central meeting point at Dickinson. The Bismarck District would take in the proposed McIntosh County out of the old district. The Devils Lake District would remain the same, except possibly taking in Eddy County. Grand Forks County would remain practically the same.

We feel there is no reason why Richland County and Traill-Steele should not go into one society, and have a good strong society in that way, because we realize the medical men have to put their full force behind any program at the present time. The more we strengthen our district society, the more strength the state society will have.

Then on the other two counties here, LaMoure and Dickey, throw them in with Stutsman, make this the central place as they have done in Bismarck and in the Sixth District.

The executive committee is presenting this for your consideration. We realize this will mean a change in the by-laws and constitution which cannot be done until next year, but we do feel that it would be the means of strengthening the state society. It would mean also a change in the number of councilors. Our by-laws call for ten councilors. This change would reduce them to eight councilors for the eight districts. I don't know whether you want to discuss this to-night. Some of you may want to think it over so it can be discussed when we meet again as a house of delegates. I think we should have some definite action.

Dr. Little: Traill-Steele would not like to go into that at all. We would have to drive to Fargo—the closest members would have to drive 50 miles, the farthest would have to drive about 100 miles.

Dr. McCannel called attention to the large number of men in the various districts who were not members of the Society, and stated that a concerted effort should be made in each district to contact every qualified medical man to the end that they might all become members of the Society.

Doctors MacLachlan, Aylen, and Carr invited the members of the Society to visit their respective institutions at any time most convenient for them.

Dr. McCannel appointed the following men to report on the Report of the Committee on Tuberculosis: Burton, Little, Spear, Fawcett, Greene, Sorenson, and MacGregor.

The following committee was appointed to act on the Chairman of the Council's Report: Stackhouse, Bowen and Larson.

The following committee was appointed to act on the reports of the Councilors: Ramstad, Hoeper, Long, Williamson and Sorenson.

The following committee was appointed to act on the Secretary's report: Wicks, Fergusson and Lewis.

The following committee was appointed to act on the Committee for Proposed New Form of Scientific Programme, as well as recommendations for new standing committees: Ramstad, Ruud and Wood.

Dr. Stackhouse inquired if any action had been taken on the formation of a Women's Auxiliary, to which Dr. McCannel replied that nothing had been accomplished.

A motion was duly made, seconded and carried that the meeting adjourn, at 11:30 P. M., to meet again at 10:30 A. M. the following day.

SECOND MEETING

HOUSE OF DELEGATES

The adjourned meeting of the House of Delegates was called to order by President A. D. McCannel, at 10:30 A. M. on May 18, 1936.

Secretary Skelsey called the roll, the following members being present:

Murdoch MacGregor, M.D., Fargo.
G. F. Drew, M.D., Devils Lake.
G. M. Williamson, M.D., Grand Forks.
F. L. Wicks, M.D., Valley City.
N. O. Ramstad, M.D., Bismarck.
L. B. Greene, M.D., Edgeley.
E. L. Goss, M.D., Carrington.
A. E. Spear, M.D., Dickinson.
T. H. Lewis, M.D., Fargo.
R. E. Pray, M.D., Fargo.
B. B. Sedlacek, M.D., Fort Totten.
P. H. Woutat, M.D., Grand Forks.
P. G. Hoeper, M.D., Williston.
R. W. Pence, M.D., Minot.
A. R. Sorenson, M.D., Minot.
H. A. Brandes, M.D., Bismarck.
F. W. Fergusson, M.D., Kulm.
R. C. Little, M.D., Mayville.
C. E. Stackhouse, M.D., Bismarck.
W. W. Wood, M.D., Jamestown.
W. H. Long, M.D., Fargo.
A. D. McCannel, M.D., Minot.
A. W. Skelsey, M.D., Fargo.

REPORT OF COMMITTEE ON COUNCILORS' REPORTS

The undersigned committee has reviewed the reports of the Councilors, and hereby makes the following recommendations to the House of Delegates:

1. That the physicians of each county form a county physicians club to co-operate with the state economic committee and the Welfare Board of each county, adopt its plan, and make every effort to put it in successful operation in each respective county.

2. That it recommends redistricting of the state to form fewer and stronger societies as recommended by the President.

This committee feels that the recommendation of the New Jersey Society regarding the pure food and drug legislation be left to the A. M. A. for action as it sees fit.

In regard to the old age physicians' retirement fund suggested by Dr. Reuben Guralnick of Boston, it recommends that the matter be further investigated by this Society as it is developed by the national association.

N. O. Ramstad, M.D.
W. H. Long, M.D.
A. R. Sorenson, M.D.
G. M. Williamson, M.D.
P. G. Hoeper, M.D.

A motion was duly made, seconded and carried that the foregoing report be accepted, as well as the reports of the various Councilors.

Dr. J. W. Bowen, for the committee to act on Dr. L. B. Greene's report as Chairman of the Council, recommended that said report be accepted.

REPORT OF COMMITTEE ON TUBERCULOSIS

Committee Report

Dr. L. B. Greene: This report is just tentative. The Committee is in every accord with the report of Dr. MacLachlan, except in a few minor items. The report is an exceptionally good one and crammed full of common sense, and should be given careful consideration and complete co-operation by the members of the profession.

In the opinion of the committee, the matter of the use of Christmas Seal funds does not come within our jurisdiction.

This thing was threshed out rather in detail last year, as you remember. It has come up several different times. Last year I made a few remarks on the subject, but in a way, I was just "shooting in the dark" because I didn't have the necessary information. In the meantime, I have secured that information. As far as the North Dakota Medical Association is concerned, we have no more to do with the North Dakota Anti-tuberculosis Association, and affiliated member of the National Anti-tuberculosis Association, and no more to say about them, than we have about the Beneficent and Protective Order of Elks, The Shrine, or the Florence Crittendon Home. This is a separate organization.

One point which has been brought up and severely threshed out is in regard to the disposal of the Christmas Seal money. There is one point I want to bring out, and that is this—that is a national organization, and in order that the chapter in North Dakota be an accredited member of this organization, they have to make a report every year. This report consists of several different things. First, I want to read from the constitution of the National organization. * * * Now that means that they cannot delegate to any organization in the state the control of any of their funds, and I think they have been misinterpreted to a certain extent. We have not, as members of the medical profession understood them. We can request co-operation from this tuberculosis association, but we can not step out and tell them how they must dispose of their funds. As a matter of fact, the funds received from the Christmas Seal sale are divided four ways. The seals are sent out to the county superintendents of schools; from the county superintendents of schools, they are sent out to the schools in the counties, and the seals are sold by the school children, and the proceeds of that sale are divided. Five per cent goes to the National Tuberculosis Association; five per cent is set aside for purchasing of supplies, such as literature and materials, along that line; forty-five per cent of it stays right in the county in which it was collected and remains in the hands of the county superintendent of schools, and forty-five per cent goes to the state association. Out of this forty-five per cent that goes to the State Association, and the additional income that the state association has, which are individual and collective donations and that is about all, the Pennant is published, campaigns of education are put on, and one particular part, you might say, of the Anti-tuberculosis Association, has been the Preventorium Camp at Camp Grassick. That has been maintained for eight years, and it was started in the first year with 33 children; last year there were 150. In eight years it has taken care of 837. These are not tuberculous children; they are under-nourished children that have been gathered in through the agencies of the county nurses and health officers in the various counties. These children have come from every county in the state. They have been sent up there for five weeks' camping course in which they have been taught all the principles of hygiene and sanitation that it is possible to teach them. They have been given a regular routine to observe, and they have been fed up. Many of those children go back with a gain of five or six pounds, sometimes as high as seven or eight. A careful physical examination has to be made of the children before they are sent, and a regular weight card is kept of them every day. I have seen several of the children when they came back, and I found there has been a marked improvement in their physical condition. They have learned things there which they will put into practice.

All of the money that has been spent on Camp Grassick is $5,900. Of that amount $1,622 was subscribed by popular subscription and individual donations like the service club or the Bible Club of your town or my town sends, or John Jones sends a few dollars to the fund. Two thousand two hundred dollars was put in by the various counties of the state. In some of these western counties where the people did not have a nickel to send these under-nourished children there, or couldn't get enough popular subscription to pay the expenses, the county superintendent paid it out of these seal funds that he had in his possession. Now that leaves only about $2,000 of the expense of that camp last summer that was born by the State Anti-tuberculosis association out at that camp there.

I doubt if very many of you men have visited that Camp. I made it a point to go out there and look over every building. It represents quite an investment. The original investment was made some years ago when they bought the land and central building. Since that they have had a donation of a cottage by the individual members of the Bismarck Order of Elks, who put up a cottage costing $1,400. The Grand Lodge of A. O. U. W. built another cottage which cost them between $1,000 and $1,500. There was another organization, the Grand Lodge of A. F. and A. M. of North Dakota which built a third cottage there. The Northern Pacific donated a mail coach which they have made over into a boys' sleeping car. There is a very nice infirmary up there now almost completed, donated by Fannie Dunn Quain of Bismarck.

There are many personal donations to the place, which fills a place in our fight against tuberculosis by way of education, if nothing else, and the Committee does not feel that the medical profession of the state, if they knew all the facts, would be opposed whatever to the continuation of that Camp.

The Executive Committee of the State Tuberculosis Association at the present time has three men on it whom you do not need to fear. Two of them are past presidents of the Association. The President of the Anti-tuberculosis Association is Dr. Pray of Valley City; another member is Dr. LaRose of Bismarck, and I happen to be the third member. You do not need to fear us. We are going to give the State Association co-operation in every way possible, but under the rules and by-laws of the National Anti-tuberculosis Association, we can not turn the control of our funds over to any organization, the North Dakota State Sanatorium, or any other agency. I am sure you can see how it is, so with these explanatory remarks, I move the adoption of this report. The only thing brought out in this report of Dr. MacLachlan in which we differed at all was the question of the disposal and use of the Christmas Seal money. It is not within our jurisdiction.

Dr. Sorenson: How much of this money was actually used in the cure of tuberculosis the past year?

Dr. Greene: That is hard to tell. There isn't possibly such a very big percentage of it, if you call direct treatment of tuberculosis, testing and so on and so forth. I am sure a lot of you people get the Pennant and if you are careful to look over the reports in the Pennant, you will find an accounting of all expenditures. You will find a full page under the caption "Christmas Seal Funds." It shows just what money has been spent in each individual account, and what it was spent for, in rather abstract form. The individual bills are not there. The month before they contained the report of the Auditor on the finances of the State Association, and it accounted for the spending of every nickel. There was a resolution that came out that carried a question concerning $1,900 unaccounted for in this report. It actually is accounted for, but it possibly wasn't made so plain to the average reader; yet it could be detected. It was accounted for in this way—$955 represented the money that was sent to the National Tuberculosis Association. The remainder of it is an unexpended, unaccounted-for balance remaining in the hands of the various county organizations, or in the hands of the various county superintendents.

Dr. Sorenson: Forty-five per cent, isn't it?

Dr. Greene: Yes, left right in the counties in which funds were secured.

Dr. Williamson: What is that spent for?

Dr. Greene: That has been spent in various counties in different ways. In some of the counties it has been used in defraying the expenses of children to Camp Grassick; in some counties for protective work; in some for tests. It is intended to use more of this fund in the future for tests. The Association at its last meeting adopted a resolution to help out in every possible way the tuberculosis testing, putting on the Mantoux tests, and anything else that the Association wants to do.

Dr. Williamson: I have inquiries from Cavalier County asking if bills for $35 or $40 for glasses could be paid out of this fund.

Dr. Greene: In some of the counties there has been corrective work in the line of glasses. There is an open criticism in regard to the custom of leaving this money in the hands of the county superintendent of schools in each county. It has been suggested that it should be left in the hands of the Superintendent of Public Health in each county. There is a little drawback there, because the Superintendent of Public Health in each county is a doctor, and putting this money in the hands of one doctor to dispose of, as he sees fit under certain rules and regulations, call for criticism from all the rest of the doctors in the county. The fact that the money is secured through the efforts of the school children in selling the seals, I think more than anything else, led to the fact the county superintendent of schools was appointed custodian of funds in each county.

Dr. Sorenson: Don't you think when these seals are sold to the people of the state, the people think their money is going to the treatment of tuberculosis?

Dr. Greene: I imagine that is true, but here is your proposition: It is not only going to the treatment of tuberculosis, but it is going to the education that is necessary to stamp out tuberculosis. You can't get around the fact that this preventorium at Camp Grassick—if it isn't anything else—is a system of education that ultimately tends to bring up among our younger people the ideas of how they can avoid tuberculosis.

Dr. Sorenson: Don't you believe that if this money was turned directly to the people actively engaged in or concerned with the treatment of tuberculosis, that more value could be obtained than at present?

Dr. Greene: That is possible, but you can't really turn this money over to any individual, in a way that will do so much good. The idea of some people is that this money might be better used if we closed Camp Grassick, and used the money that has been spent there to put a traveling clinic on the road to test out these early cases. Well, the actual saving that there would be in that is only about $2,000 to run that camp.

For ten years, from 1915 to 1925, the Anti-tuberculosis Association of North Dakota received an appropriation from the Legislature averaging about $10,000 bi-annually. That was used in sending out a clinic, followed by a nurse afterwards, and everybody agrees they did some good work; however, it cost money. In 1925, we figured that this really was not the work of the Anti-tuberculosis Association, but should properly come under the care of the Health Department of the State of North Dakota. In 1925, we got our first full-time health officer, and we decided that the Health Department, or some such organization, could take care of this work, so it was turned over by the Anti-tuberculosis Association to the State Health Department. Unfortunately, the Legislature did not appropriate any money for the use of the State Health Department for that purpose.

Dr. Pray: How long does this improvement last in the children from Camp Grassick?

Dr. Greene: You would have to have a complete follow-up. In the children I have noticed myself, that is the ones I have had occasion to examine before their acceptance, and those I have kept an eye on since, I really am convinced that the plan did some good. It gave the children a better idea of what they should eat, and what they should not eat; an idea of the hours to spend in rest; and a few of the fundamental rules of physical well-being, anyway; and I think it has been money well spent in education.

Dr. Sorenson: I don't think there is any question in our minds as to the value of Camp Grassick, but I think there is a question as to whether or not more good could be obtained if the funds were turned over to people directly in contact with the treatment of the disease, in view of the fact they are so short of money.

Dr. Greene: That is the idea—it is just a little bit like the big dog wanting the little dog's bone. Right here in North Dakota in the State Sanitorium, last year they had an appropriation of $285,106.20, and now all the funds put together of the anti-tuberculosis association in North Dakota is about five per cent. Of course, there was a portion of that used for construction purposes. I haven't any quarrel with the Sanitarium up there at Dunseith. Dr. MacLachlan is as good a friend as I have in the state. I have been for that sanitarium all the time. I am for any appropriation that will help them out. They are getting a new unit, which God knows they need. Yet I can't help but feel that this little additional money they would get from this State Anti-tuberculosis Association, provided the State gave it to them in absolute violation of the national rules and regulations, wouldn't amount to much anyway.

Dr. Sorenson: I disagree with you. They needed a sterilizing equipment; however, through very close figuring they were able to get it. Any money they might get would assist materially in obtaining equipment they need very badly.

Dr. Greene: That is true. It might be that that can be worked out. You certainly have a committee on the Anti-tuberculosis Association that is willing to cooperate in every way possible, and if it is possible that they can give that institution a sterilizing unit. I think they will do it; but they are not going to turn over all their funds to spend the way outsiders figure they should be spent. They can't do that if they are going to continue to function as a national society.

Dr. Sorenson: Is this the same set-up as in all the states, or is it peculiar to North Dakota?

Dr. Greene: No, it is conducted a little differently in this state than in some others, but the general scheme is about the same. To a large extent, there is a certain amount of leeway that is allowed the individual state organization. I know in the past some financial assistance has been given the people there at Dunseith in the purchase of some equipment. I imagine in the future that that same assistance can be given, but I do not think that the Anti-tuberculosis Association is going to completely turn over to any institution the control of their funds and the absolute saying of how they are going to be spent.

Dr. MacGregor: I think the weak spot, if you can't turn the funds over, and that point is quite definite, is in this forty-five per cent remaining in the counties. Now I have collected for a lot of glasses, and I think it is an absolute misappropriation of funds. Couldn't your committee recommend to the superintendents of schools the kind of program you want them to carry on?

Dr. Greene: Absolutely, that is what the committee is going to do. We have already started to do that and have even gone so far, in two instances, where they came to pay for X-rays of suspected cases and to put on the test, to supply the necessary equipment to do that. They are going to help in every way they possibly can; however, I don't think they are going to agree to turn over to them funds directly to the State Sanitorium officials at Dunseith to spend as they want to spend them. I don't think they will agree to do that.

Dr. Williamson: The only objection I have, this money is raised under a misconception. That Christmas Seal with a Red Cross on it makes a powerful appeal when children go out to sell them. Nine-tenths of the people think they are giving for tuberculosis purposes only. When little children come into my office and I put my hand in my pocket to pay for these seals, I am paying for them for the purpose of preventing tuberculosis and trying to find such cases. I am not giving that money to pay for glasses; and I think most people feel that way. If the Anti-tuberculosis Association doesn't want that done, why not set up some sort of an organization where people would know that the funds are going to be used in cases of incipient tuberculosis.

Dr. Sorenson: They are misleading the people. Let Camp Grassick go on—I think it can be carried on from service club donations, the Elks, Masons, Workmen, and things of that kind.

Dr. Greene: As fast as is possible they are trying to put Camp Grassick on a self-supporting basis, and I think they will have it on a self-supporting basis within a year. It is doing a good work; there is no question about that. The counties are not paying for glasses now.

Dr. Sorenson: You raised the question about having a doctor on this committee. Couldn't it be arranged so a doctor, the county health officer, the superintendent of schools and the county attorney, a committee of three could be appointed to see how this money is spent and not leave it all to some lady or gentleman who might be the county superintendent.

Dr. Greene: That is a very good suggestion. I will take that suggestion back to the Anti-tuberculosis Association, with the statement that the State Medical Association offers it as a suggestion. That might be more satisfactory all around, if the committee of the various counties be composed of the county superintendent of schools, the state's attorney, and the superintendent of public health.

A Delegate: It might even be better instead of the state's attorney, to make the county judge a member. He is brought in contact with a lot of people.

Dr. Greene: I will take all those suggestions back to the Anti-tuberculosis Association; and believe me, gentlemen, there is no friction on our part. We want to co-operate in every way and I don't think you will have any trouble. I think this is all going to be ironed out. Granting in the past that some counties have spent money in ways that might be considered unauthorized and not in the stamping out of tuberculosis, you can be assured that as fast as those corrections can be made, they will be made.

Dr. Sorenson: In order that Dr. Greene may have something concrete to take back to the State Anti-tuberculosis Association, I would offer as a motion, that it is the sense of the House of Delegates that they recommend to the State Anti-tuberculosis Association, that they concentrate their efforts on the direct care of tuberculosis; that the expenditure of the money be, so far as possible, expended directly in the care of active tuberculosis.

A Delegate: Second the motion.

Dr. MacGregor: One of the new committees suggested here is the group on child health. They can co-operate with the Anti-tuberculosis Association very nicely, with the funds coming in.

Dr. Brandes: Dr. Sorenson, you are leaving out the prevention of tuberculosis.

Dr. Sorenson: The State Anti-tuberculosis Association already is spending money in prevention work; for instance, Camp Grassick. I think I would like to keep this motion as it is, that the money we now have be directly allocated to the treatment of tuberculosis, to the existing state tuberculosis association, diagnosis and treatment.

Dr. Lewis: It just so happens the Cass County Medical Society passed a resolution and instructed us to introduce it to the House of Delegates on the very subject. This matter has been discussed very thoroughly. As far as I am concerned, I am not personally in accord with the resolution, but I will present it because I have been instructed to do so. It amounts to a great deal the same as has been discussed here. There is just one thing in which I wish to take issue with Dr. Greene. He says this medical society has no jurisdiction in this matter. That is true possibly, but we can pass a resolution and recommend to these various bodies.

To place the resolution of Cass County in the records, I will read it:

"The following resolution was adopted by the Cass County Medical Society, Friday, April 24th:

"WHEREAS, Tuberculosis is a communicable and controllable disease, the control and eradication of which is the duty of the organized medical profession to direct and prosecute, and

"WHEREAS, The North Dakota Anti-tuberculosis Association is a powerful and laudable body with a history of meritorious service, organized and carried on, collecting and disbursing funds for the sole purpose of driving tuberculosis out of North Dakota, and,

"WHEREAS, Recent advances in the study of tuberculosis control has proven to the satisfaction of the Cass County Medical Society that the so-called preventorium of summer camp type of activity, which affects a relatively few of those in need of help for a pitifully short time at a relatively high cost, is of minimal benefit in actually controlling tuberculosis, and that all possible money should be concentrated on one type of work considered to be of greatest value, viz., finding of the open cases through use of the tuberculin test, followed up by X-rays, and tracing down of contacts, and then isolation of the open cases, and

"WHEREAS, It appears from the financial report of the North Dakota Anti-tuberculosis Association published in the January-February and March-April issues of the 'Pennant,' official organ of the Association, that somewhat over $5,000 of the $19,000.91 collected from the sale of Anti-tuberculosis Christmas Seals in the preceding year went to support the summer camp, Camp Grassick, or to further similar preventorium work, and that $1,400, or less than one-tenth, was expended on the case-finding program, and it would also appear that $1,927 of that $19,110.91 is unaccounted for by the combined published reports, and

"WHEREAS, It is the opinion of the Cass County Medical Society that the summer camp at Camp Grassick is a commendable philanthropic project offering a delightful outing for certain under-privileged children, its value in a campaign for control and eradication of tuberculosis, judged by modern medical standards and knowledge, is very little;

"NOW THEREFORE, BE IT RESOLVED, by the Cass County Medical Society that it go on record against, and that it respectfully request and urge the Board of Directors of the North Dakota Anti-tuberculosis Association to discontinue the expenditure of Anti-tuberculosis Christmas Seal funds in support of further summer camps, or so-called preventorium work, and further to request and urge that such funds so released be used in furthering the case-finding and isolation of open case work.

"BE IT FURTHER RESOLVED, That the delegates to the 1936 North Dakota State Medical Association from the Cass County Medical Society be directed to present a similar resolution to the House of Delegates of the North Dakota State Medical Association at the May, 1936, meeting.

"BE IT FURTHER RESOLVED, That copies of this resolution be prepared and transmitted to the officers and directors of the North Dakota Anti-tuberculosis Association, the officers and directors of the Fargo Tuberculosis Association, members of the Cass County Board of Health, Dr. Maysil Williams, State Health Officer, Dr. D. L. Matthaei, President of the State Health Association, Dr. A. D. McCannel, President of the State Medical Association, and to the Secretaries of the component societies of the North Dakota Medical Association, with the request that the latter officers read the resolution to their societies."

The question was called on Dr. Sorenson's motion. A standing vote was taken, the result being ten ayes and ten nayes.

Dr. Sorenson: I will be willing to accept this amendment of Dr. Brandes that prevention, diagnosis and treatment be included.

The second accepted the amendment; the motion was duly put as amended, and carried.

REPORT OF COMMITTEE ON SECRETARY'S REPORT

Dr. Drew: Concerning two paragraphs in the Secretary's report, we make the following recommendations:

1. Co-operation with the New Jersey State Medical Association plan urging a congressional investigation under oath of the Pure Food and Drug Law, now known as Senate Bill No. 5, and that our secretary be instructed to enter into correspondence with our North Dakota Senators regarding thereto.

2. We favor a continuation of the University of North Dakota's two-year medical school and instruct our state secretary to so notify the American Medical Association's council on education and medical schools.

G. F. Drew, M.D.
T. H. Lewis, M.D.
F. W. Fergusson, M.D.

Dr. Fergusson: I move the adoption of this report. (Motion duly seconded and carried.)

Dr. Greene: I move that the report be accepted on the Committee on Tuberculosis. (Motion duly seconded and carried.)

REPORT OF COMMITTEE ON PROPOSED NEW FORM OF SCIENTIFIC PROGRAM

Dr. Ramstad: The undersigned committee recommends that Section Two of Chapter VIII of the By-laws of the North Dakota State Medical Association be amended to read as follows:

"The committee on scientific work and program shall consist of the president and secretary and retiring president, and two members appointed by the president from the local society where the annual meeting is to be held. It shall determine the character and scope of the scientific proceedings of the Society, subject to the provisions of the instructions of the House of Delegates, or of the Association, or to the provisions of the Constitution and By-laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions, and other business shall be presented, which shall be adhered to by the Society as nearly as practicable."

N. O. Ramstad, M.D.
Henry Ruud, M.D.
Wm. W. Wood, M.D.

The purpose of that is to make use of the ability and experience of the retiring president. We recommend that instead of three members of the local society, that only two members be appointed and that the retiring president may serve on the committee in order that we may have advantage of his judgment and experience of the preceding year.

Dr. Williamson: That is changing the By-laws, or amending them. I move that the rules be suspended, and that this amendment be adopted.

Dr. McCannel: You have heard Dr. Ramstad's report. Any second? (Seconded and Carried.)

Have you any recommendations on the new committees, Doctor?

Dr. Ramstad: We will have them ready for you tomorrow, Doctor.

NECROLOGY REPORT

Dr. G. M. Williamson read the following report, which was prepared by Dr. Grassick:

As the leaves weakened by mildew, injury or age, drop from their parent stems and return to earth, so shall we, each in our time, lose our grip on things that are and become as they. As we pay our tribute of remembrance to those of our comrades who have fallen, let us think of them as "Sensing Beauty's Gleam."

W. W. King

Dr. W. W. King was born March 2, 1869, in New York City and died at his home in Milnor, N. D., October 4, 1935. He graduated from the Franklin High School, Franklin, Ohio. He was a graduate of a normal school at Lebanon, Ohio. He received his medical and surgical training at Miami Medical College, Cincinnati, Ohio. He served his internship at Cincinnati General Hospital two years. He was also a graduate of the Chicago Eye, Ear, Nose and Throat College. He served as Assistant Surgeon at the Central Branch Hospital for disabled soldiers at Franklin, Ohio. He was licensed in North Dakota in 1901, and practiced for a short time in Fargo, after which he moved to Milnor, North Dakota, where he established a residence and where he remained and practiced his profession until his death, except for one year he spent in California and two years in Florida. He was connected with the Richland County Medical Society and through it with state and national associations. Dr. King was county health officer in Sargent County for ten years, Chairman of the Four Minute Men in the county during the war. At one time he was chairman of the Republican Central Committee in Sargent County, also Chairman of the Hennepin County Republican Central Committee.

He was prominent in fraternal circles and well known as an outstanding physician in the southeastern part of the state. The people whom he served so long and so well speak highly of him as a friend, neighbor and public spirited citizen. He was laid to rest in Lakeview Cemetery and is survived by a wife and son.

Gustav Ferdinand Ruediger

Dr. G. F. Ruediger died at his home in Pasadena, California, July 6, 1935, aged 59 years. He was a graduate of the University of Wisconsin, and in 1905 of Rush Medical College, Chicago. He was licensed in North Dakota July 10, 1907. After completing his medical course, he had two years of intensive study in the laboratories of Dr. Ludwig Hektoen, pathologist, and of John B. Murphy, surgeon, both of Chicago. Thus equipped he accepted the position of pathologist, and bacteriologist in the School of Medicine in the University of North Dakota, and automatically became director of the State Public Health Laboratory, an institution that was created by the 1907 Legislature and which was officially opened on July 1st of the same year. It will thus be seen that he broke virgin soil and in so doing brought to his work a skill, capacity and enthusiasm that soon won for him an enviable name and position among his fellows. He was recognized as an authority not only on laboratory technic and findings, but on sanitation and public health as well.

He was not content with the performance of routine duties but pushed out into the fields of original research and investigation and succeeded in disclosing secrets that have proved of great value to humanity. He did pioneer work in water purification and sanitary sewage disposal. It is gratifying to know that after a quarter of a century, his findings have been endorsed and his recommendations adopted. In 1909 Dr. Ruediger served on the board that selected the site for our State Tuberculosis Sanitarium at Dunseith. In 1914 he accepted the directorship of the LaSalle Illinois Hygienic Institute. It was while there that the enemy that dogged his steps in the years to come was recognized, heroically met, and stubbornly fought. To Nevada, Arizona, New Mexico, and California he went fighting for mastery at every step and in the enthusiasm of his art, giving to the last the best in service of which he was capable and few gave better. Of him it might be said, as he pursued his work: "I am wounded but not slain. I'll lay me down and bleed a while and then I'll rise and fight again."

Neil McLean

Dr. Neil McLean was born in Durham, Ontario, on June 26, 1878, and died in Lott Hospital, Livingston, Montana, August 21, 1935. He was a graduate of Hamline University in 1906, and was licensed to practice in North Dakota July 11, 1907. He engaged in the practice of his profession at Devils Lake, but when the breath of war was in the air he elected a military career and was commissioned as Captain, First North Dakota Infantry in 1916, and was ordered to the Mexican border. When the United States entered the World War he served both in this country and overseas. He was discharged from the Federal service in 1919, but was named Captain in the Medical Corps, North Dakota National Guard, when the 164th Infantry was reorganized in 1922. He was a member of the American Legion, the Disabled American Veterans of the World War, and the Veterans of Foreign Wars. He leaves a wife, three brothers and three sisters to mourn his passing. He was laid to rest with military rites in the G. A. R. cemetery, Devils Lake.

Robert E. Cuffe

Dr. R. E. Cuffe, of Olga, North Dakota, according to the records of the A. M. A. was born in England in 1854, and died June 28, 1935. According to the same source, he received his medical training in the University of London, Faculty of Medicine, London, England; that he was licensed in North Dakota in 1887, and that he practiced severally at Langdon, Concrete, and Olga.

Dr. Cuffe came to what is now North Dakota in territorial days, and thus may be classed as one of our pioneers. He was a fine representative of "A Doctor of the Old School" who took his place on the frontier, grew up with the country and gave the best he had to those in need. This type of physician is fast slipping away, and we do well to honor their names for the part they played in the social, economic and professional development of our State. And so we say with Carleton:

> "He has done his duty fairly,
> And has acted out his part.
> And the strong old country doctor,
> And the weak old country doctor,
> Is entitled to a furlough
> For his brain and for his heart."

George H. Coffin

Dr. G. H. Coffin was born in Minneapolis, Minn., Oct. 1, 1879, and died at Longview, Wash., Sept. 9, 1935. He received his early education in the Minneapolis Public Schools, and his medical training at Hamline University where he graduated in 1904. He was licensed in North Dakota April 15, 1909. Dr. Coffin first located at Bonner's Ferry, Idaho, and in 1906 moved to Butte, North Dakota, and latter to Drake, N. D., where he practiced for sixteen years. He then went to Longview, Washington, where he remained until his death. Dr. Coffin was a public spirited citizen and held many positions of trust and responsibility. Surviving are his widow, Clara A. (Yokel) and a son, Frank.

George A. Durnin

Dr. G. A. Durnin was born in Dungannon, Ontario, February 18, 1876, and died in Bottineau, N. D., October 18, 1935. He graduated from Trinity, Toronto, Ontario, in 1904, and was admitted to practice in North Dakota, July 14, 1904. He started practice at Russell, North Dakota. In 1906 he became associated with his brother, Dr. Charles Rurnin, at Westhope, N. D., and in 1914 he moved to Bottineau where he practiced with Dr. Alex R. McKay until 1930, after which the practice was continued by Dr. Durnin. He took courses at London and Vienna, specializing in eye, ear, nose and throat, and was a member of the American College of Surgeons. He was a surgeon of repute and drew to his clinic from an ever widening circle. Dr. George, by which name he was familiarly known, was a splendid type of the modern progressive physician. His professional skill and pleasing personality won for him an honored name in medical circles and made him a welcome guest at social gatherings. He was a Mason of high standing and his funeral services were in charge of the Knights Templar, with a large attendance from far and near. He is survived by his wife and two daughters, five brothers and one sister. The name of Dr. Charles A. Durnin is linked with lasting memories.

Olaf Severin Leedahl

Dr. O. S. Leedahl of Stanley, N. D., was born in Norway, April 23, 1881, and died at his home at Stanley, N. D., October 28, 1935. He came to America with his parents when seven years of age and received his academic education at Augsburg Seminary, Minneapolis, Minn., and his medical training at Hamline University, where he graduated in 1907. He was licensed in North Dakota in 1909. He located at Palermo, N. D., where he remained ten years and then moved to Stanley, N. D., where he remained until his death.

Dr. Leedahl was public spirited and served for many years as a member of the school board, and as coroner for the county. He also was surgeon for the Great Northern Railway and Chief Medical Examiner for the Sons of Norway, a national fraternal organization.

Dr. Leedahl was a faithful, diligent and efficient physician, a consistent Christian gentleman, and an honored member of society. He leaves a wife and daughter to mourn his passing.

Henry Herbert Healy

Notice of his death and obituary appeared in the September 14, 1935, issue of THE JOURNAL-LANCET.

Henry Gustav Woutat

Notice of his death and obituary appeared in the February, 1936, issue of THE JOURNAL-LANCET.

Alano E. Pierce

Dr. A. E. Pierce was born at Dexter, Minnesota, April 22, 1900 and died at Minot, North Dakota, March 14, 1936. He took his academic and professional work at the University of Minnesota and graduated in Medicine in 1924. After interning in the Minneapolis General Hospital he went to Europe for graduate study. On his return he located in Kansas City, Missouri, where he practiced for a few years. He became associated with the Northwest Clinic, Minot, North Dakota, in 1929 and remained a member of that group until the time of his death, specializing in internal medicine.

Dr. Pierce was, in addition to his skill as a physician, generally recognized as a brilliant student, a fine musician, and a lover of art. As a tribute to his memory several of his favorite selections from the Masters were played at his funeral.

Dr. Pierce's professional attainments were recognized outside as well as inside the group in which he practiced, and the whole Northwest suffers a loss at his passing. He was a member of the American College of Physicians and of the American Medical Association.

He leaves wife, parents, and sister a legacy of happy memories and the Medical Profession a worthy example of work well done.

Richard Hudson Beek

Dr. R. H. Beek was born at Lockport, New York, August 6, 1869, and died at Devils Lake, North Dakota, May 6, 1936. He came to Larimore, North Dakota with his parents in 1882, attended local schools, entered the University of Minnesota, and graduated from the Medical Department of that institution in 1894. He was licensed to practice in the State July 17, of the same year and immediately located at Lakota, where he established his home and practiced his profession until the time of his demise.

Dr. Beek was a splendid type of manhood. He was not only a physician of high standing, but a citizen who was respected for his many sterling qualities of mind and heart. Whether in the sick room, in the marts of business, in social and fraternal circles, or in his association with fellow practitioners, he was always the clean and cultured gentleman. He was honored by his associated by being elected president of his local medical society and president of the State Medical Association. North Dakota will long cherish his memory and extol his virtures.

William B. Wanner

Dr. W. B. Wanner was born in Lodi, Wisconsin, February 16, 1868, and died at Jamestown, North Dakota April 18, 1936. He graduated from Rush Medical College in 1893 and was licensed in North Dakota in July of the same year. He began his practice in the State at Cooperstown and after a few years moved to Wimbledon where he remained until his death.

Dr. Wanner was one of those steady and reliable members of the group of early physicians that the people learned to trust. He was ethical in his professional conduct, fair and aboveboard with his patients, and cleancut in his dealings with his fellowmen. He was an honored member of the profession, and of the community he served so long and so well.

Helena Knauf Wink

Dr. Helena K. Wink, one of a family of twenty-four children, was born May 26, 1854, on a farm in southern Michigan and passed away at Jamestown, North Dakota, February 16, 1936. She graduated from the Medical Department, University of Michigan, in 1883 and, inbued with the pioneer spirit, located at Jamestown, Territory of Dakota. She did her part—and did it well—in the "Winning of the West." It required faith, courage, and fortitude for a woman to face the privations and hardships of frontier life, tact to overcome prejudice, and skill to meet the emergencies of frontier practice. All of these she had and more and gave of them freely for the relief of suffering, the prolongation of life, and the upbuilding of the New Commonwealth.

For over a half a century, Dr. Wink ministered to the ills of the people, interested herself in civic and social affairs, and devoted her energies for the betterment of the people among whom she labored. She proved a veritable angel of mercy in many a humble home, to many a troubled heart, and to many a pain-wracked frame. North Dakota honors this pioneer woman physician.

Dr. Williamson moved the adoption of the report, which was duly seconded and carried.

DR. MCCANNEL: There is one other committee here, the chairman of which is not present. At our meeting in Chicago last February, the question was discussed, that Iowa and other states have adopted an interprofessional association, the thought in mind being to have the men interested in more or less common interests to get together and support each other, not necessarily to be compelled to get behind any legislation, or other act they want, but to have an understanding. For instance, in Iowa they have an association of medical men, dentists, druggists, nurses and veterinarians. That association looks after the legislation and puts forth a united front. Out in Oregon, they have one which includes other professional men—lawyers, engineers, university men, with more or less similar objectives.

Last February, I believe it was, the Greater North Dakota Association had a meeting in Fargo at which Frank Darrow, the chairman of our committee on Public Relations was present. I happened to be in Fargo at the same time although I did not sit in on the meeting. They have enlarged the scope of the committee in this way—they have taken in different professional men, in different groups, so that they can get together on any particular legislation that is helpful or otherwise, and can put a united front to any objectionable legislation on things they feel are not for the best interests of the state. I am sorry Dr. Darrow is not here today. He is very enthusiastic about this, and no doubt you will hear more from him, as he is the chairman of the committee. The other members of the committee you will note are named on your programs. We have some members of the press on the committee. I think this movement is a step in the right direction.

Dr. Drew, chairman of the Auditing Committee, reported that they had examined the books of the Association and found them to be correct. He moved the adoption of the report, which was seconded and carried.

Dr. Brandes stated that the Economic Committee would like the reaction of the Society upon the mass immunization.

DR. MCCANNEL: When the public health funds go into the county for every doctor in the county who will agree to take care of the indigent, they will take care of the supplies. That was Dr. Miller's suggestion, if doctors will take care of the indigents free. *Yours* was to do mass immunization and pay $10 per diem for the doctors doing it.

Dr. Brandes: Yes, that was the same plan that we had in the previous years.

Dr. Williamson: Can you force anybody to take immunization under the law?

Dr. McCannel: No, you can't force anybody. The point I think Dr. Brandes is bringing out is, if we leave it to the physicians, at least you can go to the schools and get all of the children at one time, which means a lot.

Dr. Brandes: The Public Health Department wants every child immunized. Now they say that is regardless of whether they can pay for it or not. They want the medical men to carry it out. In the past, we have said this, that we will be glad to take care of those on relief rolls at ten dollars per day. That was just to take care of the man's time away from the office for probably four or five hours, and those able to pay should see their family physicians. That is just the difference between the public health angle and the state association; and this other plan is that the relief agencies will pay ten dollars to carry out the immunization for the children on the relief rolls.

Dr. McCannel: We can't speak for our county. I think our county was the only one which didn't take it on. We figured it was pauperizing a lot of people.

Dr. Larson: I believe we should take a very definite stand on this because in our county I happen to be the health officer in the county. We have the city health office under the influence of lay organizations. There has been a great deal of propaganda. They have almost stampeded the city health officer into getting such a plan, but he as a practicing physician, doesn't like to do it. Now comes the propaganda in the county, so they put it up to me and want to know what I am going to do. I stalled them off as I want to know what the attitude of the State Medical Society is. Some one has said that the public health people change their minds every week or two, and possibly we have.

I believe we should take a definite stand on the policy, not on the method, because there is no one method which will work the same in every county. I think that we have to be very careful not to antagonize the public health people and the Federal government. We will have to meet them half way on it. If we say we are not going to participate in any program, and we are going to insist that all who can pay come to our offices and charge them three or four dollars per child for every immunization, we will create a lot of adverse criticism on the part of the laity. They can't understand why if they pay taxes, their children can't be given *free* immunization! If they go to their family physician, sometimes it will cost them eight or ten dollars per family to have the same work done.

What are we going to do? Shall we try to adopt a program of a little cheaper immunization in our offices? Personally I think that is the solution of it. Then after that, I believe it should be up to the county medical society. Your province here is only to establish a general policy.

Dr. Pray: What are we getting for it now?

Dr. Larson: No definite rate. There is another thing which enters into the picture. The public health people will probably supply the vaccine. Is that a good principle? The people will say, "We are getting free medicines; why don't we get free doctors?"

Dr. McCannel: That is the question, Dr. Larson. As far as each county is concerned, that will be a problem for each medical society in every county to consider and settle for itself.

Dr. Larson: I would suggest you have a committee appointed to investigate this matter and report on it tomorrow.

Dr. Ramstad: We have a very active economics committee which is conversant with the details of this work. I would like to suggest we refer the matter to it and have the members consult with Dr. Miller and the health officers, to learn if something can't be worked out. I feel our economics committee is more familiar with this than any other. I made that as a motion.

Dr. McCannel stated the motion, which was seconded, and duly carried.

Dr. McCannel: In the matter of re-districting—this would carry with it a new number of councilors, which would mean amending the By-laws—a procedure which has to be started this year if it is to be finished next year. As I understand it,Traill-Steele does not care to go in with Cass County. Others have expressed a desire to join with other societies. That being the case, it will mean nine councilors instead of ten, as our constitution now stands, hence the procedure will have to be started this year, so it can be decided next year.

Dr. Fawcett: I move you, Mr. Chairman, that the re-organization be put in process looking forward to a re-adjustment of these district societies; not compelling any society to disband; and that there be an adjustment in the number of councilors in the state; our Association being prepared to act at the next annual meeting.

I might say that Dr. Spear and myself did a great deal of work at the Aberdeen meeting in 1930. Those are very delicate things to discuss, and try to put over. Let the societies remain as they are, if they so wish: but if they want to come in with others, let them do so. Let this thing be a slow process of evolution or change, not compelling any society to disband. There are some of us who are old timers, who do not like to have any changes made; but we just want to struggle on; however, eventually a lot of these smaller societies will quit; but let them do it as they see fit.

Dr. Williamson: I feel if you would name your councilors as your committee, and let them get together and work this thing out, it would be a good idea. Let them be the committee and bring in their report.

Dr. McCannel: Do you include that in your motion?

Dr. Fawcett: Yes.

Dr. McCannel stated the motion, which was seconded, duly put and carried.

The following Committee on Nominations was appointed: Drs. Stackhouse, Spear and Wicks.

A motion was duly made, seconded and carried that the meeting adjourn at 12 Noon to meet again at 8 A. M. the following morning.

THIRD MEETING

HOUSE OF DELEGATES

The adjourned meeting of the House of Delegates was called to order by President A. D. McCannel, at 8:00 A. M., on May 19, 1936.

Secretary Skelsey called the roll and reported a quorum present. The following responded:

G. M. Williamson, M.D., Grand Forks.
N. O. Ramstad, M.D., Bismarck.
L. B. Greene, M.D., Edgeley.
E. L. Goss, M.D., Carrington.
W. A. Gerrish, M.D., Jamestown.
T. H. Lewis, M.D., Fargo.
B. B. Sedlacek, M.D., Fort Totten.

P. H. Woutat, M.D., Grand Forks.
A. R. Sorenson, M.D., Minot.
F. W. Fergusson, M.D., Kulm.
R. C. Little, M.D., Mayville.
H. Van de Erve, M.D., Carrington.
W. H. Long, M.D., Fargo.
L. W. Larson, M.D., Bismarck.
A. D. McCannel, M.D., Minot.
A. W. Skelsey, M.D., Fargo.

REPORT OF COMMITTEE ON MEDICAL EDUCATION

Dr. H. E. French, Chairman, rendered the following report:

Your committee on Medical Education can make formal report in almost exactly the same words as were used last year.

In popular health instruction, in addition to the agencies noted before the committee, would commend the efforts of your new committee on Maternal Welfare.

At the School of Medicine at the University, the work has continued under the same handicaps, and with the same results as noted last year. The inspections and survey of medical education has gone on, and the school was visited on April 16 and 17, by Dr. Weiskotten representing the Council on Medical Education, and Dr. Rees representing the Association of American Medical Colleges. No report has yet been made by the inspectors.

Those interested in the school can only hope that the council and other rating bodies can realize that there are other, and perhaps more important considerations than fine plants and showy equipment. It is to be hoped, too, that the state can realize the need for the work done by the school, and be willing and able to support it much better than it has in the last few years.

Dr. Greene moved the adoption of the report, which was duly seconded and carried.

Dr. Williamson: There is a suggestion I might make. I think when we are talking to our legislators and so on, we should try and impress on them the importance of the medical school of the University. I believe one of the things they scrutinize very carefully is the budget. It is very low and should have more money. Now the action the national councilors took last fall when they passed the first resolution was not popular in the Federation, and I think they would have quite a bit of trouble in putting two year schools out of business. I think they serve a need in our state especially. We tried to present the subject as well as we possibly could at our Federation meeting last February, and I believe our argument was very well received. I believe our school will be continued and about the only thing they will have to criticize is the appropriation.

Dr. McCannel: Dr. Ramstad, have you any report on the special committees?

Dr. Ramstad: Dr. Moore told me last evening that he had to return home; however, he submitted a report to the house of delegates on behalf of his committee.

Dr. McCannel: Go ahead and read it. I really think it is worthwhile. It is one of the outstanding things that has been done during the past year.

REPORT OF COMMITTEE ON MATERNAL WELFARE

Secretary Skelsey read the following report:

To the House of Delegates in meeting at Jamestown, May 18, 1936, the North Dakota Committee on Maternal Welfare begs to submit the following report of its activities:

We were appointed as one of the regular committees of the North Dakota State Medical Association by the President, Dr. McCannel, in November, 1935. Our first major objective was the sponsoring of as many obstetric meetings for the component district societies of the State as time would allow. Every committee member was assigned a topic, and everyone accepted his subject. The proposal was not to present obstetric programs in a hit or miss manner, but to present a symposium on obstetrics dealing with the major causes of obstetrical deaths, infections, toxemias, and hemorrhages. Emphasizing the importance of the maternal mortality triad, infections, toxemias and hemorrhages, we usually presented three papers at each meeting. Discussion was based on the papers as a symposium after the formal presentation of all of them. We have found that this is by far the best way to provoke discussion. Informal case reports based on one or more of the subjects discussed invariably came to light, and the discussion proved general, active and helpful. Up-to-date your committee has presented programs before five of our state societies. We have appeared at Fargo, Jamestown, Grand Forks, Devils Lake and Bismarck. This plan of district meetings has met with the splendid co-operation of the officers and members of the various societies contacted. It has been more a question of finding time to put on all the programs requested, than creating a demand for them.

It is obvious that your state committee can function best only as a directing agency and as a clearing house, and that the most effective work will be done by the district societies working in co-operation with your state committe. To further this we have requested that each district society appoint a sub-committee on maternal welfare. We recommend that each sub-committee consist of three physicians, at least one of whom shall be a rural practitioner. We recommend that such sub-committee (1) sponsor obstetrical programs in their own societies at stated intervals; (2) increase case reports in obstetrics by the members; and, (3) foster educational work among lay organizations such as Federated Women's clubs, Parent-teachers' organizations, and Homemakers' clubs.

Up-to-date these committees on maternal welfare have been formed in the societies visited, and are ready to proceed with the work. We feel that if post-graduate instruction in obstetrics is to be made available to our physicians, it must be brought to them. To this end, preliminary arrangements have been made to hold three two-day obstetric seminars or refresher courses in obstetrics and your committee has been most fortunate in securing as our clinician, Dr. Jennings C. Litzenberg of Minneapolis, who has agreed to give us the necessary six days in the very near future. In each case, in the city where the seminars are held, the district committee or medical committee on maternal welfare will be in charge of arrangements, and during the first night of the seminar, a stated meeting of the host district medical society will be held at which time Dr. Litzenberg will present a formal paper.

The chief subjects to be discussed in the seminars are:

1. Prenatal Care.
2. Prevention of Infection.
3. Prevention and Control of Toxemias of Pregnancy.
4. Prevention and Management of Abortions.
5. Breast Feeding.

Your committee can not leave the subject of professional education without acknowledging with gratitude the splendid co-operation it has received and is receiving from Dr. Maysil M. Williams, State Health Officer for North Dakota.

The committee entered the field of lay education by radio. Committee members prepared a series of eight radio talks, each fifteen minutes in length, and they were broadcast under the name of the Committee on Maternal Welfare by Dr. H. E. French, Dean of the Medical School of the University of North Dakota, and Chairman of the Committee on Medical Education of the State Medical Association. The committee desires to express its thanks to Dr. French for his co-operation in making these broadcasts possible. An additional series of radio talks, dealing with infant welfare, has now been prepared by members of the State Association at the committee's request, and these will be produced at the very near future. Every radio program must have a radio signature. Ours is "See Your Doctor." Throughout all of our discussions we have repeatedly urged the importance of the personal relationship between the patient and the physician. It is quite obvious that the personnel of the committee has not been mentioned.

As your committee sees it, its task is to develop a state program which will increase the prestige of the individual practitioner of medicine, and to bring our influence to bear with state health officials to further that end.

We have stressed and will continue to stress, both to medical and lay audiences, the personal relationship which must exist between patient and physician to improve the standards of obstetrics, and reduce maternal and infant mortality. We believe that only through the co-operation of the physicians of the state will education of the patients to seek the highest type of obstetrical service available to them, can this or any other program of maternal welfare succeed.

As we stated in the beginning of this report, your committee has not had time to contact all the district societies of the state. We have indicated some of the projects under way, and some of our plans for the future.

Respectfully submitted,
John H. Moore, M.D.
J. F. Hanna, M.D.
E. M. Ransom, M.D.
Paul W. Freise, M.D.
John D. Graham, M.D.

Dr. Greene moved the adoption of the report; seconded by Dr. Sorenson, duly put and carried.

Dr. Ramstad: There was a suggestion there that is quite important for members in the local societies, and that is they appoint a committee in each local society dealing with this subject, and I believe it would be well if a suggestion could be made from the state society to each of our local societies, because after all that is where the good work is going to be done. This committee has done wonderful work. We appreciate what they did for us in Bismarck and Mandan, and I am sure that other places where they have put on their program are equally satisfied with what they have done, and wish they could be brought to better attention in order that each local society may do better work. It is rather tiresome to read in some of these sob magazines about the terrible mortality and inefficiency of the physicians. It is about time that we brought to the public the fact that good obstetrics are done in North Dakota as well as other places.

REPORT OF COMMITTEE ON IMMUNIZATION

In the absence of Dr. H. A. Brandes, Chairman, Dr. W. H. Long read the following report:

Your committee, after consultation with Dr. K. E. Miller of the U. S. Public Health Service and Dr. Maysil M. Williams, State Health Officer, and recognizing the fact that mass immunization is not only advisable but inevitable, would recommend the following statement of policy:

1. That physicians co-operate with local health departments in an immunization program;

2. That free immunization be limited to indigents and border-line cases, the latter to be determined by local relief organizations;

3. That physicians, who serve during the immunization of indigent and border-line children, be paid on a per diem basis, similar to that established during the immunization program in 1934-35;

4. That those able to pay be immunized by their private physicians;

5. That the plan adopted in any locality be modified to meet local conditions, through the co-operation of the local medical society and the local health department;

6. That we encourage the public to consult its private physicians for the immunization of all children, and urge that local medical societies adopt a fee schedule for such immunization that will be fair and equitable, and will not discourage the principle of patient-physician relationship.

H. A. Brandes, Chairman.
W. H. Long, M.D.
P. H. Burton, M.D.

Dr. Long moved the adoption of the report; seconded by Dr. Fawcett, duly put and carried.

Dr. Williamson: There is no objection, is there, to putting that resolution in the local papers? Then anybody who reads it will understand. We do lots of good things that should be brought to the attention of the public.

Dr. McCannel: That should be brought to Dr. Darrow's attention then.

Dr. Long: Of course, the publicity to stir up interest in the immunization will be carried out by the board of health and health agencies. We suggest this policy as a means to go about it so these health agencies would not expect us to donate all of our service.

Dr. Larson: It might be of interest to you to know that we passed a resolution at the health officers' meeting this morning which dovetails right in with this thing. I think this whole matter should be given publicity, not only amongst the laity, but particularly amongst the doctors, in some special form of bulletin and notice, so that the same thing will be done in each county. We passed a resolution which I will read:

"WHEREAS, We as health officers realize that all children should be immunized against smallpox and diphtheria, and

WHEREAS, We believe that those able to pay for such immunization should consult their family physicians, while the indigent and border-line cases should be immunized at public expense in clinics conducted by physicians, who shall be paid a per diem fee for their services,

NOW THEREFORE, BE IT RESOLVED, That we as public health officers co-operate with the local medical societies in the promotion of a program of immunization."

We are thus tying the health officers up to a policy that is in conformity with the state medical association policy.

Dr. McCannel: Dr. Larson's report just dovetails into this report of Dr. Brandes. Don't you think it would be worthwhile to get out a bulletin to every member in the state?

Dr. Long: Dr. Brandes expects to get a copy out to each society.

Dr. McCannel: Then wouldn't it be well to get this health officers' report included?

Dr. Long: Very good. And when the news ask for something, it might be well to tell them that we went on record in favor of immunization, and so on.

Dr. McCannel: Does any one here have a report of any committee? I have exhausted my list. Is there anything else to come before the House of Delegates?

I might say we have an invitation for a place of meeting next year.

Dr. Ramstad: I would like to make a motion to the effect that the President of the society be authorized to appoint the following committees, to consist of five members each: a committee on Child Welfare; a committee on Crippled Children; and a committee on Maternal and Child Health. These committees would co-operate with the federal and state departments of our government in carrying out the new provisions we heard about last night.

Dr. Woutat seconded the motion, which was duly put and carried.

Dr. McCannel: I might say in the matter of designating who shall be termed indigent on this immunization program, this question came up in some of the larger cities; it is not so much of a problem in the smaller towns. Our law as it now stands on venereal disease is that the health officer in the past has been the one to decide whether he is indigent or not. Then he either treats it himself or sends it to some one to whom they wish to go. Then that bill comes into the city and the county commissioners are compelled to pay the bill. There is no other outlet. It has grown to be quite a burden on some of the cities. I took it up with Dr. Williams from a welfare standpoint, as money was being taken away from the general welfare work, and she said although that was the law, they were not interested in it, in the least, in deciding who was indigent and who was not. It is the duty of the welfare board of the county, and that is the way it will have to clear. In the future the county commissioners will have just right for not paying the bills. It has been terribly abused in the past. Any one who got venereal disease would go to the city health officer, and after being treated by him, or by some other doctor, the city commission paid the bill, and then the county commissioners were obligated by law to pay that bill to reimburse the city. I think the same case will have to be worked out here. These cases will have to clear through the county welfare board.

Dr. Larson: The attorney general has written an opinion on that.

Dr. McCannel: Yes, that is what Dr. Maysil Williams told me. Do you think that is right, Dr. Larson?

Dr. Larson: The health officer is not the one to pass on the indigent. You can see what a racket that could be. Any case that came into you, you could call it indigent and send the bill in. You could make the diagnosis, refer it to yourself, treat it, and receive the pay.

Dr. McCannel: We have quite a problem right in Minot on that. Our section over west of Second Street, over in the red light district, there are lots of people obtaining an income from questionable methods, but who get free treatments. They have incomes, but probably not apparent; yet they come under the law as a public menace.

Anything else to come before this House?

Dr. Greene: In the absence of any report of any resolutions committee, I would make a motion that the appreciation of the Association be extended to Stutsman County Medical Society and the City of Jamestown for the excellent care they have taken of us. (Motion seconded.)

Dr. McCannel: Will you authorize the Secretary to make those resolutions?

Secretary Skelsey: I will make them. (The motion was duly put and unanimously carried.)

Dr. McCannel: We have an invitation for the next meeting, from Grand Forks. Probably that comes under the nominating committee. Is there any other invitation for the state meeting?

Dr Fawcett: Just in order that we have a record, I move that we accept the invitation from Grand Forks.

Dr. Stackhouse: In returning that report, I might state that out of consideration for Grand Forks, we suggest they hold the meeting for 1937, but in 1938 Bismarck must be considered.

The motion was duly seconded, put and carried.

Dr. Williamson: I might say on behalf of the Grand Forks District Medical Society and the city, if you have any suggestions to make aside from the conduct of the mechanics of the affair down there, we would like to hear them. Are you all satisfied, and do you like to have the meetings on Monday and Tuesday? It seems to be a custom quite well established. I was quite opposed to it in the beginning, on account of the early training, to have these meetings on Sunday nights. It has grown into a custom just the same as we grew into the habit of going to baseball games on Sunday. Now is that program satisfactory, or would you rather have the delegates' and the Councilors' meeting on Monday or Tuesday night? I will take any suggestions to the fellows and have them taken into consideration. The wishes of our president may be expressed. We should start our meeting promptly at seven P. M., as we can't run so late as we did Sunday night. We could have our dinner at six o'clock and then start our program at seven o'clock. We could get through a lot of business by half past ten or eleven that night.

Dr. McCannel: There does seem to be a lot of lost motion. When we adopted this plan at Minot last year, our thought at that time was to try to get a larger attendance at the meetings. I think the point Dr. Williamson brings up is worthy of discussion. Perhaps we will have to have two banquets, one like last night, and then have the program as you have arranged it today. Instead of having Monday more or less left to our own devices, we might combine the program of the health officers and the medical society.

Dr. Larson: I found last night that I had been put in as president of this health officers association. I didn't have any idea at all that such would be the case. This discussion is very interesting to me because I will be forced to try to at least hold the health officers association at its present level, and if possible, increase it.

Now I think the big trouble yesterday was that there was not enough publicity given to that program. I was on the program—we will take that off the list. Everything else was excellent, as good as you will have today. Dr. Myers gave just as interesting a talk as he did last night and there were many fine papers and discussions, not just some fantastic public health program. I don't believe you could have had any better round-out program than that.

I believe you should consider these health officers' organization. We do not have enough members in this state to come to the meeting to warrant two or three sections going at one time. I don't believe it is practicable. It can be done in larger states, but when you bring men out here from Minnesota, Chicago, and other places and have a handful of people to listen to talks, it is not right. I think we can dovetail these programs together.

Dr. Gerrish: Our Committee getting up this annual program, wrote in ample time to the North Dakota State Health Officers' Association, and later wired in an endeavor to have their program complete, but were unable to obtain it in more detail than appears in our printed program.

Dr. Larson: I am glad to learn that. I know nothing about the organization meeting outside of the one in Bismarck several years ago. I will see to it that they get publicity next year and I think that we should attempt to co-operate with this committee on scientific program.

Dr. Gerrish: Why not make it a joint meeting and not specify the public health program, or the other. Wouldn't that be a good idea?

Dr. Larson: They want to retain their identity. There were several good papers there that any man interested in general work should have heard.

Dr. Goss: You know yesterday the house of delegates and the council had a meeting at the same time the health officers were in session. We could not attend both. I think if we had one more day for the health officers, and then have two days for the society, it would be better.

Dr. Ramstad: From the standpoint of the House of Delegates and Council, and based upon the increasing importance of the work of these representative bodies, it seems to me we ought to give ample time to the consideration of problems of the society. Wouldn't it be better if we could meet at two o'clock on Sunday or Monday, or any day you say, give the afternoon and part of the evening to the consideration of the problems of our society. I don't believe that we give enough attention to some of these matters. They are quite important, establishing the policy for the entire state, and we will possibly continue to have more matters to consider. I would like to suggest that we ought to meet at two o'clock the day before the meeting and have a good honest, sincere discussion of our problems, and a man who cannot arrange his affairs so as to be there and represent the society, get some one else to do it. This is important enough so it should have our best consideration. I would like to suggest that we take up our business meeting at two o'clock the day before the regular session.

Dr. McCannel: I think that is true. The other night we all felt the pressure for time, I am sure,

Dr. Greene: We have lumped up here trying to do the work of the Association. As a matter of fact, yesterday we had so many committee meetings of one kind and another, that some of us didn't get over to hear a single scientific paper and it wasn't because we were loafing around either. I think Sunday is the best day to meet on, and we can pretty nearly all manage to be at the place of meeting by two or three o'clock in the afternoon as well as we can at seven o'clock at night. It we started on Sunday afternoon instead of Sunday night, the first meeting of the House of Delegates and Council could be held at half past two or three o'clock and then the various standing committees could report. Any committees which it was necessary to appoint could be appointed. Then in the evening at seven or eight o'clock the business could all be transacted. We spent all day yesterday in mulling over various reports. We could get practically all the business of our association completed and leave ourselves free to enjoy the scientific program.

There isn't any reason why a scientific program of two days could not be made interesting to all of us, the public health department, the Academy, and the Association all at once. There were a lot of papers presented at the Academy I desired to hear. If the three organizations could get together, secure the best talent available and put on an interesting program, we would all be willing to sit right down and listen to every paper presented, when we do not have our minds distracted. The business meetings of the three separate organizations could be transacted the first day on Sunday, with the exception of probably one short business meeting the last day in each organization.

Dr. McCannel: I would suggest that on that Sunday meeting, have them gather for luncheon; otherwise they will be straggling in all afternoon. Have the luncheon at one o'clock. Grand Forks is centrally located and every one could be there.

Dr. Williamson: Anything you fellows want, we will try to put it across.

Dr. McCannel: Dr. Lewis has brought up a subject. What are we going to do about the committee in the state on birth control. I had two very fine ladies approach me in Minot while I was sick in bed and present the subject to me. I extended them this courtesy, the promise that I would at least bring it up at the meeting.

Dr. Lewis: By request of some of the members of the Cass County Society, I was supposed to introduce a resolution here dealing with this subject. I am very much opposed to birth control. I think it would be a mistake for the Society to go on record as favoring this movement. It calls for a lot of publicity that might be undesirable; however, that is only my opinion, and not the opinion of the Society. I will introduce this resolution or not, just as the delegates desire. If I do introduce it, I want it to be understood that frankly I am against it personally.

Dr. McCannel: Any further discussion on it? I learned a new term. It seems they don't call it birth control; they call it spacing.

Dr. Larson: I am pretty sure that the A. M. A. went on record against approving birth control. I am basing that on the clipping I saw in the Kansas City Star, but I haven't seen the formal report. The committee brought in a resolution which certainly was against any official approval of the principle of birth control.

Dr. Sorenson: In view of the great importance of this question, and the magnitude of the thing, and the great amount of study it will require, I would move that the matter be tabled until our next session next year.

The motion was seconded, duly put, and carried.

Dr. McCannel: We will have the report of the Nominating Committee, Dr. Skelsey:

REPORT OF COMMITTEE ON NOMINATIONS

Dr. Skelsey presented the following report of the Secretary of the Committee:

President, W. A. Gerrish, M.D., Jamestown.

President-elect, E. L. Goss, M.D., Carrington.

First Vice-president, W. H. Long, M.D., Fargo.

Second Vice-president, L. B. Greene, M.D., Edgeley.

Secretary, A. W. Skelsey, M.D., Fargo.

Treasurer, W. W. Wood, M.D., Jamestown.

Delegate to A. M. A., 1937, A. P. Nachtwey, M.D., Dickinson.

Alternate, C. E. Stackhouse, M.D., Bismarck.

Councilors

Fourth District, A. R. Sorenson, M.D., Minot.
Fifth District, F. L. Wicks, M.D., Valley City.
Ninth District, John Crawford, M.D., New Rockford.

State Board of Medical Examiners

G. M. Williamson, M.D., Grand Forks.
A. W. Skelsey, M.D., Fargo.
A. D. McCannel, M.D., Minot.

Meeting place for 1937 convention—Grand Forks, with consideration being given to Bismarck for the 1938 meeting.

Dr. Fawcett: I move that the report be adopted in total.

Dr. Fergusson seconded the motion, which was duly carried.

Dr. Larson: Let the record show that I am representing Dr. H. A. Brandes who was called out of town, representing the Sixth District.

A motion was duly made, seconded, and carried that the meeting adjourn sine die at 9:00 A. M.

PROCEEDINGS
of the
COUNCIL
of the
NORTH DAKOTA STATE MEDICAL ASSOCIATION
1936

FIRST MEETING

Monday, May 18

The first meeting of the Council was held in the Masonic Club Rooms, Jamestown, and was called to order by the chairman, Dr. L. B. Greene, Edgeley.

Members present: Drs. L. B. Greene, M. MacGregor, P. G. Arzt, N. O. Ramstad, F. L. Wicks, E. A. Spear, G. F. Drew, E. L. Goss and George M. Williamson.

MINUTES

Dr. N. O. Ramstad moved that the minutes as published in The Journal-Lancet of August 15, 1935, be adopted.

The motion was seconded and unanimously carried.

REPORT OF AUDITING COMMITTEE

Drs. Drew and Spear of the Auditing Committee reported that they had examined the accounts of Treasurer W. W. Wood and found them to be correct.

Dr. Wicks moved, seconded by Dr. MacGregor, that the report be accepted and filed; unanimously carried.

REPORT OF EDITORIAL COMMITTEE ON JOURNAL-LANCET

Dr. N. O. Ramstad, chairman of the committee, gave a satisfactory report regarding The Journal-Lancet. He stated that the relations during the past year were pleasant; that in the appearance of The Journal-Lancet and general make-up there had been steady improvement; that the Committee were satisfied with the present arrangement.

Upon motion duly made, seconded and carried, the report was adopted.

A motion was duly made, seconded and carried that the meeting adjourn to five P. M.

* * *

When the Council re-convened at 5 P. M., all members were present as aforementioned.

Moved by Dr. Ramstad, seconded by Dr. Drew, that the usual amount of $200 be allowed Stutsman County Medical, and the Southern District Medical Society, they having also participated in the annual meeting, to assist in the payment of expenses of said annual convention. Carried.

Moved by Dr. MacGregor, seconded by Dr. Spear, that the bill of Dr. H. A. Brandes, Chairman of the Committee on Medical Economics, for the past year be allowed. Carried.

Moved by Dr. MacGregor, seconded by Dr. Goss, that the Committee on Medical Economics and the Public Relations Committee be allowed $200 each for the ensuing year. Carried.

ELECTION OF OFFICERS

Moved by Dr. Bowen, seconded by Dr. Ramstad, that Dr. L. B. Greene be elected President of the Council, and that Dr. George Williamson and Secretary of said Council. Carried.

There being no further business, the Council adjourned.

George M. Williamson, M.D.,
Secretary.

PROCEEDINGS
of the
GENERAL MEETING
of the
NORTH DAKOTA STATE MEDICAL ASSOCIATION
1936

FIRST DAY

Monday, May 19—Evening

The first general meeting was called to order in the Dining Room of the Gladstone Hotel, at 7:00 P. M. The annual banquet preceded this meeting, at which Dr. Lee B. Greene acted as chairman.

Dr. Greene: In looking over this enthusiastic gathering we have here tonight, I am reminded of the old saying that it is love that makes the world go round, but it is certainly true that it is alcohol that supplies the power.

You know I have been coming to these medical association meetings for about thirty years, and I still see some of the grey heads that were grey when I started to come, and the Lord knows how long they are going to come. They are still here and unbowed. You are a little bit different from the Irishman:

Pat had a fine farm and a good bunch of cattle. He was a good Catholic and he had a good Lutheran neighbor, who had a fine thoroughbred bull. Pat had envied this neighbor for a long time and was very desirous of owning the bull, so he saved his money, sold everything from which he could obtain a little money, until finally he had a thousand dollars accumulated. He then went over to his Lutheran neighbor and told him he would like to buy the bull, to which the neighbor consented.

Pat took the bull home and that afternoon the Father dropped in. Pat was so elated over the purchase of the bull that he asked the Father to look him over. He said, "Pat, you have certainly got a fine animal there, but you have a lot of money tied up in him, so I would get him insured, if I were you. And then he comes from a Protestant family, so it wouldn't do any harm to put a little holy water on him." So Pat thought that was a pretty good idea. He went to town and got the bull insured and brought home a bottle of holy water. He put both the insurance policy and the bottle on a little shelf in the kitchen, and sat down to supper. While they were eating, one of these old fashioned summer storms came up accompanied by some thunder and flashes of lightning. Pat jumped up and grabbed for the bottle of holy water, but in his hurry he got hold of a bottle of turpentine. He ran out to the barn and threw the contents of the bottle over the bull. Immediately it started to beller and tore out of the barn into the yard where he pawed around and made considerable fuss. Pat stood off a little way, eyeing the bull in disgust, and said, "Well, you poor Protestant son of a gun, you can't take it, can you?"

When I look over this crowd coming here year, after year, I don't think this story applies to this group of men. They can certainly take it on the chin, and have been taking it on the chin for the last five years.

Now, without any further remarks, I will call on our President to give his address:

Dr. McCannel: Mr. Toastmaster—ladies and gentlemen: This reception is rather overwhelming. I am not used to receptions of this kind; however, I must say I appreciate it very much.

Before starting my regular address I will make a few remarks in regard to something I will touch on in my address later. I was very glad to sit in at a meeting today at noon of the public health workers and to hear a report by the representative of the Rockefeller Foundation, who has been making a survey of conditions in North Dakota and he had a lot of wonderful facts that I am sorry every one here did not have the advantage of hearing, to know not only the condition of our state from a medical standpoint, but also an economic standpoint as well. He made some statements today that were rather enlightening to me.

There has been so much talk about the Social Security Act in the past few weeks, that I am quite sure as Dr. Miller has told us today, there is a certain amount of misunderstanding in regard to the terms and motives of the act. I was glad to hear from Dr. Miller that it was not the purpose of the Public Health Department at Washington, or the Bureaus at Washington, to dictate the policy of this service that was going to be given through the allocation of funds to North Dakota. I was particularly glad to hear that was true under Sections 5 and 6—I happen to be more familiar with some of the other terms of the Social Security Act, and on those particular terms, I am sorry to say they are not the same as those pertaining to Sections 5 and 6. In other words, as much as we know that we need help in this country, and as Dr. Miller has told us this fund is an equalizing fund, nevertheless we must realize there is going to be a certain amount of control from Washington, irrespective of what we might read.

The terms of the Social Security Act in regard to Sections one to three, the old age benefits, crippled children, etc., are very specific. These funds are granted under certain conditions to the State of North Dakota and other states. Of course, in some of these particular groups such as child welfare, dependent children, old age assistance, all the political units in the state shall function under one head, or one group. That is one condition, but the state must before they acquire any funds or allocation from the Federal Government through the Social Security Board, meet certain requirements. These requirements are dictated by Washington, and if we do not meet those requirements, then our allocations are cut off. That is something I wanted the men of the North Dakota Medical Association to go home fully realizing. I will refer to it later on in my speech. I don't want any misunderstanding.

We are not going to have any dictation from Washington as far as Titles 5 and 6 are concerned, according to Dr. Miller. I know from my associations on the Welfare Board of North Dakota that we do have to meet certain requirements. Those requirements are very specific, and not only that, but they are subject to change at any time, if we do not live up to the letter of the law, so I want you to have a clear understanding, a clear conception of the Social Security Act. Whether it is a step toward the socialized practice of medicine or not, I am not prepared to say. I think we should all fully understand the terms of the Act, and make a complete study of it. I am going to tell you later on some of the other propaganda we have to combat at this time.

PRESIDENTIAL ADDRESS

May I first express my gratitude and appreciation to the members of this Association, for the honor of being elected its president. It is no less a pleasure than it is a compliment to be entrusted with a share in its management, and the privilege of working toward the realization of the ideals of the founders of the North Dakota State Medical Association.

I think it would be well for us to consider the problems which existed at the time the State Medical Association was organized, and the type of men to whom we are indebted for the creation of this organization, as well as the many others, who, down through the years, have guided the society through many experiences. Most of the early practitioners of our state longed for an organization so that co-operation would exist among the members of the profession, even though they were widely scattered. These men were young, progressive and ambitious; and although they had cut loose from the conventions of the East they were by no means lacking in culture and refinement. Generally speaking, they were from good families, having collegiate educations and excellent medical training, with degrees from medical schools of unquestionable standing. Their one motive was to so organize the medical profession in North Dakota, that the people might receive the best medical service, and at the same time, safeguard the interests of our profession.

The first meeting of this organization was held in Grand Forks in 1888. There were about 15 present. A few papers were given and committees appointed. The second meeting was held in Larimore in 1889, at which time the constitution and by-laws were adopted. Doctor Wheeler, of Grand Forks, moved that the code of ethics of the American Medical Association be adopted as the code of ethics of the society.

Forty-six years ago, in 1890, the third meeting was held here in Jamestown. My old friend. Doctor John Fulton of St. Paul, read a paper on "Progressive Medicine," in which he referred to the law just passed by the North Dakota Legislature for the regulation of the practice of medicine, with these words, "You have now, in this state, the most excellent law for the control of scientific medicine and surgery, of any state in the union. It is an improvement on all of the best laws of the different states." In closing Doctor Fulton said, "Gentlemen of the medical profession, let us try to lift constantly the standards of our profession; let us show that medical service ennobles men, and brings them nearer to the ideals of humanity." This recalls to our minds the splendid foundation laid by our predecessors. The high standard set by them has ever been an inspiration to the members of our Society.

Here, let us pause a moment to pay tribute to those highly esteemed and well beloved members of our Society who have passed on during the last year: S. M. Ferguson, formerly of Brocket; H. H. Healy of Grand Forks; Neil McLean, of Devils Lake; W. W. King, of Milnor; O. S. Leedahl, of Stanley; H. G. Woutat, of Grand Forks; W. B. Wanner, of Wimbledon; G. A. Durnin, of Bottineau; Helena K. Wink, of Jamestown; Alano E. Pierce, of Minot; Gustav Ruediger, formerly of Grand Forks; R. E. Cuffe, formerly of Olga; G. H. Coffin, formerly of Drake; and Richard H. Beek, of Lakota. Their passing is a great loss to the medical profession, to the people of the state to whom they devoted a lifetime of service, and to those of us who were privileged to be their friends.

Dr. Williamson has a few words from Dr. Grassick, the chairman of our Necrology Committee:

Dr. Williamson: It is only a few lines as the introductory to the necrology report which was handed me by Dr. Grassick, the patriarch of our Society, who is now in the eighty-sixth year of his life, living in California. These words were penned by a man who has attained the ripe old age of 86. I hope you will listen to it attentively. I hope that when any of us fellows here tonight reach the age of 86, that our brains will be as clear and brilliant as the man who penned these few words:

> "As the leaves weakened by mildew, injury or age, drop from their parent stems and return to earth, so shall we, each in our time, lose our grip on things that are and become as they. As we pay our tribute of remembrance to those of our comrades who have fallen, let us think of them as 'Sensing Beauty's Gleam.'"

Dr. McCannel: Thank you, Dr. Williamson. Now to continue:

The problems which confronted this society in its early years are entirely different from those which confront us today. I do not believe that at any time in the history of this society, has there been a more acute realization of the various forces which are at work, locally, nationally, and internationally, to undermine the fundamental principles for which this society was organized, and for which its membership stands today.

The great problem before the medical profession today is the question of socialized medicine, or compulsory health insurance. I think it would be well for us to consider conditions which have brought about the so-called demand for socialized medicine. This evolution and extention of medical care has been closely connected with, and largely conditioned by the extraordinary medical progress of the last half century. This is not the place to tell the story of the advances that have been made during that period in every field of medical science and practice, of the achievements in research, the growth of specialism, the technical inventions, or of the expansion of hospitals and medical institutions which was largely an outgrowth of scientific progress. All these things led to a division of medical service, a development that was accelerated by similar developments in the industrial world. Sickness insurance was born when mechanistic theories of science were at their zenith, and when the mechanization of industry was still hailed as an unmixed blessing.

Just who is responsible for the demand for socialized medicine and compulsory health insurance? It is not citizens of the middle class who are clamoring for this change. It is not the fellow who pays the taxes. It is social service workers and those who stand high in the political world who hope to obtain gain for themselves. They pretend to see the need of revolutionizing our medical set-up and practices. The origin can be plainly traced to foundations such as Borden, Filene, Rosenwald, and Milbank. These foundations have an endowment of thirty million dollars, definitely converted to the policy of forcing health insurance under state and federal supervision, and have undertaken the direction of large programs devoted to the socialization of medicine. The directors of these foundations are not medical men. They are men socially trained and socially minded; sentimental theorists whose future depends upon putting over a program of this kind. Their work is to spread propaganda for compulsory health insurance and socialized medicine. It is the duty of every medical man to become fully informed on this subject, so that he can intelligently meet and discuss the arguments which roll so glibly from the tongues of the hired theorists of the foundations.

Whether or not we shall have state medicine is the national debate proposition selected this year for the high schools, and discussed by more than fifty thousand students.

We have only to study the experience of socialized medicine in other countries, to realize how unsatisfactory it has been. Socialized medicine was first adopted in Germany in 1883. From our study of their system we find that not only was the type of medical service lowered, but that diseases increased alarmingly; that due to constant malingering, industry suffered greatly from loss of time; and that the medical men were reduced to a state of pauperism. The average income of the doctors in Germany is $800 per year. The only doctors who are affluent are those who specialized in diseases which the poor could not afford. Socialized medicine traveled from Germany to England, and by 1911 we find England adopting legislation creating old age pensions, unemployment insurance, and compulsory health insurance. There are conflicting reports as to the merits of this system, but the concensus of opinion seems to be that the tremendous cost of supervision and development of the system, together with the increasing amount of sickness, and the unsatisfactory type of service which the people receive, leaves a great deal to be desired. In England too, the medical men have been the chief sufferers, their average income being $1,200, or less, per year.

The last few years we people in the United States have been feeling the influence of the experiments which have been going on in other countries. There has been a very active attempt to socialize medicine in Canada, our neighbor to the North. Within the last few months, the Province of British Columbia has decided to experiment with compulsory health insurance by imposing a tax of two per cent on all salaries over $1,800, and one per cent on the employers of those receiving taxable incomes. This act was passed at a recent session of their legislature, and is expected to come into force at the beginning of next year.

The legislation which has been proposed at Washington would make insuring of 85 per cent of the population of the cities compulsory, but would exempt farmers and those holding small jobs. The director would not need to be a medical man, and there would be a board of laymen to administer the act. There would be a group of managers, administrators, statisticians, investigators, supervisors, clerks *et cetera*, plus a few doctors on the inside, which would lead to the formation of a political machine with tremendous influence. Naturally, the upkeep of this bureaucratic set-up would be a first lien on the monies collected, and would have to be paid before funds would be available for medical care, the supposed basic purpose of the law. With all of this legislation proposed, we must remember that in no country where it has been tried, has there been any reduction in sickness or death rates; that there has been a definite increase in the time lost from industry; and last, and most important, the standards of medical science have been lowered.

I do not think, however, that we should take the stand that a change in the manner of care of the indigent poor and the low income group is not necessary. Some change will have to be made, and I think it is the duty of the medical men to thoroughly familiarize themselves with the economic changes which have taken place; to recognize these changes, and guided by a sincere desire to promote the best interests of both the patient and the profession, help to work out a middle ground, where the interests of both will be safeguarded.

In view of all this, it is necessary that we should all become familiar with the terms of the Social Security Act, which is just another evidence of the progress toward the socialization of medicine. Although it has many factors that are very commendable, it is far from ideal as far as social legislation is concerned, and is so acknowledged by its authors. Although the majority of the activities to be carried on under the act have a direct bearing upon the medical profession, and to carry out the terms of the act, will require the co-operation of the members of the profession, social service leaders have, thus far, not only failed to consult, but have, in most instances, been unwilling to receive information from medical sources. The marked failure of economists, as well as some social training groups, to take any cognizance of the effect of the variously advocated schemes upon the quality of medical service which would be available to the sick under such systems, indicates the need of medical guidance.

Generally speaking, by the act, the Federal Government assumes certain responsibilities, which in the past were believed to be the concern of the several states. The Federal Government assumes at least part responsibility for various types of indigents, and indicates by various grants to states, its intention to shape welfare policies. The provision of the act authorizing grants to states for certain public health and welfare services, such as Maternal and Child Health, services to Crippled Children, certain public health service, *et cetera*, definitely states that "Each state is expected to improve, as far as is practical under the conditions existing in each state, services for protecting the health of mothers and children, especially in rural areas, and in areas suffering from severe economic disasters," and authorizing an appropriation of $3,800.000 to carry out the work.

Under the Crippled Children's program, the act says that "Each state is to extend and improve the services for locating crippled children, and for providing medical, surgical correction, and other services," but the act does not make any specific enumeration or description of the contemplated services. This is left to the discretion of the federal agency in charge of the allocation of the annual appropriation. The supervision of the activities in each state will be in the hands of the Children's Bureau of the Department of Labor.

Under the public health program of the Social Security Act, eight million dollars are to be distributed among the different states, to assist the states, counties, cities and other political subdivisions of the states to establish and maintain public health bureaus. This service includes training personnel for state and local health work. Before any state can take advantage of the terms of the Social Security Act, they must enact certain Legislation to meet the requirements of the Social Security Board. In addition to this, practically all of the money is allocated to the state on condition that the state match with an equal amount, the funds allocated to them.

Regardless of what you think of the terms of the Social Security Act, or the tendency on the part of the Federal Government to direct the program in the several states, we must realize that the Social Security Act, is a reality, and I think it is the duty of the medical profession to attempt to assist in every way, those in authority in the state who are responsible for carrying out the program, rather than assume the attitude that the act is all wrong; that it is an attempt to centralize power, an attempt to place the control of state programs with the bureaus in Washington, and that we should have nothing whatever to do with it; an attitude which has been assumed in some states. A little later, with this thought in mind, I shall suggest that new standing committees of the state society be appointed.

The strength of the American Medical Association, our parent organization, depends upon the strength of the state society, and in turn, the state society depends upon the strength of the district and county societies. When these societies were organized, road conditions were such that it was necessary to develop small units, some of which are finding it rather hard to function. I suggest a re-organization of the districts, so that instead of thirteen units in the state organization, there will be only nine. I believe that this re-arrangement would strengthen all of the societies, and that they would be in a better position to put on more interesting programs, for we all know that greater numbers create greater enthusiasm.

In the set-up of committees in the North Dakota State Medical, I feel that we could again strengthen our state society by dividing the committees into two major groups, one group dealing with scientific subjects, and the other with the economic problems which are confronting us. In addition to the present standing committees, I suggest that we have also a committee for Maternal Welfare, one for Crippled Children, and one for this Scientific Assembly.

I appointed a committee on Maternal Welfare this year, and it has done outstanding work in bringing to the attention of the various societies, the excellent work being done on the problems of maternal welfare. I feel that this committee should be made a permanent committee of the association, for under the new set-up made necessary by the Social Security Act, we should have a committee thoroughly informed and qualified to work with and advise those to whom the funds are allocated in the state by the Social Security Board; which would be able to speak with authority for the entire society on problems arising in relation to this subject. The money allocated to the state for Crippled Children's work will be furnished only, according to the terms of the Social Security Act, when those chosen to carry on the Crippled Children's program represent every political unit in the state. The society should have a group especially interested in this phase of medical work who will be able to work with those in charge of the administration of these funds, and speak with authority for the medical men in the state.

The duty of the committee on Scientific Assembly would be to arrange for our scientific assembly, or state meeting, with the members of the committee representing different branches of medical work. Instead of leaving the development of the program for the state meeting to the local men in the city in which the meeting is to be held, this committee would build a program, keeping in mind the different phases of medicine. I believe that the programs would thus be strengthened from year to year, doing away with a certain amount of duplication. And, in this connection, although we are having an excellent program this year, and have had for the last few years, we are losing sight of the opportunity to develop our local men in writing and preparing papers, and have depended almost entirely upon outside men. If our society is going to grow and develop from a scientific viewpoint, our local men must be encouraged to prepare papers for our state organizations. This proposed committee would, I believe, help to facilitate this plan.

You are all familiar with the problems that are facing the medical profession in North Dakota. It was my privilege last February, in company with Doctors Larson and Williamson, to be present at the Northwest Regional Conference in Chicago, where the relation of the Social Security Act and medicine was discussed. At this conference, representatives of the central states, including Michigan, Illinois, Iowa. Wisconsin, Nebraska, Kansas, Missouri, Minnesota, and North and South Dakota were present. I believe we came away convinced that North Dakota has a better set-up for taking medical care of indigents than any of the other states mentioned.

Kansas State Medical Association has entered into an agreement with the various groups of county commissioners, by which the members of the county medical societies agree to take care of the indigents at $1.00 per family per month. At the end of each month, this amount is pro-rated among the men participating in the program, according to the work done.

In Iowa they have a county plan also. For example, the Boone County Medical Society agreed to take care of all the medical work for indigents for $2,500 per year. Boone County is comparable to Ward County, with a population of 30,000, one-half the population being in one city.

In North Dakota, the passage of House Bills 289 and 338 by our last Legislature, created the Board of Public Welfare, whose duty it is to supervise all the welfare work, and to handle all county, state, and federal funds. Since our last meeting, welfare boards have been set up in every county, whose duty it is to supervise all the welfare work in the county, including medical work.

Due to the splendid work done by our Economic Committee under Doctor Brandes' chairmanship, and the fact that many counties in the state had adopted this committee's plan, which included choice of physician and a reduced schedule of fees for the period of the emergency, the State Board of Public Welfare recommended to the different county welfare boards the adoption of this plan. Many of the counties have adopted it, and, as I see it, the success and continuance of this plan, and its adoption by all the counties, depend upon the attitude assumed by the medical profession.

We must remember that the financial condition of the counties will not permit a large corrective medical program; that for the present at least, the medical work must be limited to emergency cases, necessary to relieve human suffering.

I think we are all agreed that the contract system of taking care of the medical work for indigents, is not fair to either the patient or the doctor; and in addition to that, it puts the practice of medicine on a business basis, the same as any other commodity furnished; with this difference, that the contract price is only a very small percentage of value of the actual work done, whereas other services and commodities are furnished at practically no reduction from regular prices.

Medicine has no quarrel with Social Service as such. Many of the modern Social Service activities have been fostered by and conducted in the closest co-operation with the medical profession. Medicine does not exert its influence toward political or economic power, and is concerned only in providing a personal service of the highest standards. Specialized training, investigation opportunity, human interest, and adequate regard are necessary to the maintenance of progress in this service, upon which civilization depends. To these conditions, therefore, there could be no more harmful act than the regimentation of the medical profession under a system which would not only destroy the quality of medical service, but would also place both the worker and the medical man under centralized political dominance.

So, as John Philpot Curran stated one hundred fifty years ago, "It is the common fate of the indolent to see their rights become the prey of the active."

DR. GREENE: I didn't really know you could be so quiet, but the silence of the audience was certainly a tribute to the excellent paper our President has presented.

One of the boys from Minneapolis told me a story this afternoon, which he heard in Minneapolis just before he came here. He said there were a couple of salesmen traveling over Kansas one summer, and one of those infrequent rains they have in that locality suddenly started, trapping them on the road, so it became necessary for them to seek shelter at a nearby farmhouse. When they arrived at the farmhouse they discovered the farm was run by a widow lady. She was very reluctant to take the men but finally, under the circumstances, couldn't see anything else to do, so she took them in and put them up in the best way she could. The next morning they left the place and went on about their business.

Several years later one of the salesmen happened to get a glimpse of the other fellow in a distant city. He recognized him and went up and spoke to him, saying, "Perchance, do you happen to be the gentleman with whom I drove across the vales of Kansas some five or six years ago?" The fellow traveler looked at him and replied, "It may be possible." The first man said, "You remember we were caught in a rainstorm and had to seek shelter in a farmhouse, which was owned by a widow lady." "Yes, I do remember that," his companion stated. "Well you remember that night I was very tired and I dropped off to sleep immediately and slept all through the night. It isn't possible, is it, that during the night some time, you slipped out and visited this widow lady?" His friend replied, "Well it might be possible." He says, "Perchance it isn't possible that you gave that widow lady my name and address in place of your own?" The fellow colored a little and said, "I am sorry to admit that happens to be so." The first gentleman smiled and said, "Well you do not need to be sorry. About a month ago I received a letter from a lawyer out in that locality stating this widow lady had died and had bequeathed to me her farm and $35,000 in cash."

Before the next speaker is called upon, we are going to have a few words from the President of the State Board of Medical Examiners, Doctor Fawcett.

DR. FAWCETT: Mr. President, ladies and gentlemen; and our guests:

The Board of Medical Examiners come before you tonight not only as the present members, but members back for twenty-five years; men now living in California, Oregon and Washington and in the far East are joining in this program which will be staged in a very few minutes in the form of a one-act play. We ask you to be patient with us while we stage this, because we are not accustomed to putting on plays.

The first I will call upon is a veteran on the Examining Board. He has served more years on the Examining Board of the state than any other man, barring one, our Secretary. It is our pleasure to ask Doctor John E. Countryman of Grafton to stand up.

The next I am going to call upon is a man who has served the second longest, barring our Secretary Doctor Williamson, and I am calling upon Doctor W. F. Sihler of Devils Lake.

Next, I am calling upon an examiner from the west region of the state from Dickinson, Doctor Bowen, who was a veteran of the examining board many years ago, with Doctor MacGregor of Fargo. We are going to ask these two gentlemen, Doctors Bowen and MacGregor, if they will accompany or go out in the audience and pick up the Secretary, Doctor Williamson, that he may be the star performer in this one-act play.

DR. JOHN E. COUNTRYMAN: Mr. Toastmaster, members of the Society and Guests: I hope you all noticed in Doctor Fawcett's introduction that my chief qualification for this assignment was old age.

Now so you will be lenient in your judgment, the Board of Medical Examiners in any state is not a popular institution, that is speaking collectively; individually, we hope to be known favorably. Any one taking an examination experiences some degree of anxiety before, and some degree of relief when the examination is over. Those of us who have watched candidates come and go for a number of years cannot help but notice that even the recent interne who is literally bursting with medical knowledge has his moments of anxiety. I can illustrate that possibly by relating an instance that occurred to me some years ago, shortly after the law was passed requiring medical examination for license to marry.

One day there came into my office an elderly spinster of somewhat uncertain age, accompanied by a fine, robust, prosperous-looking farmer somewhat her junior in years. She came in all smiles and said, "Doctor, we are going to be married and we want to have an examination." I said, "That is fine." I knew her pretty well so I said, "I must congratulate you. You are a very good picker." I filled out her part of the examination and had her go out in the waiting room, had the prospective bridegroom come in, and I filled out his part; then went out to the notary public's office to have it executed. Probably I was rather seriously minded as I went through the office, because the lady followed me out in the hall, greatly worried. It was her first, last and only chance, and she didn't want to miss it. She said, "Doctor is he all right, do you think he will pass?" "Why," I said, "certainly he will pass." To which she responded very emotionally, "Oh Doctor, thank God for that."

I would like to give you a little history of the medical board. It was organized in 1890 in July. There was some little discussion as to how many members, either five or nine, of whom two are still living—Dr. F. N. Burrows of Bathgate, whom I hoped to have present tonight but he was unable to come; and Doctor Charles MacLachlan—he is a perennial. If we have a celebration twenty-five years from now, he will still be here.

The first Secretary of the Board was Doctor J. R. Logan a brilliant young surgeon who acted until 1894, when he passed away. He was succeeded by Doctor H. T. Quarrie, and he in turn by Doctor H. M. Wheeler, of whom we all have most kindly recollection. In 1911 Doctor Wheeler retired, and our present Secretary, Doctor G. M. Williamson was appointed, and has served continually for twenty-five years.

The office of Secretary of this Examining Board is an arduous one. Few of you realize what it means. He has to have all of the facts concerning the laws, rules and regulations of all the Examining Boards of the United States, Europe, and several other countries, and study these to supply information to the Board at its meetings. Then in addition, since the state registration act has been added to his duties, he has added difficulties. He is faced on all sides. He has to protect the public; he has to satisfy those who have already passed the examination, and those who are coming in; he has to protect us from irregularities. In fact, if I were to attempt to describe one-tenth of his troubles and difficulties, I would be talking to you for two or three hours. If those of us who are on the Board get any complaint, we just write to Doctor Williamson. We all are sold on the proposition of "letting George do it."

As regards the personnel of the Board, it is composed of nine members appointed for three years. They are constantly coming and going; in fact every year different faces appear on the

Board so that the main administrative duties of the Board rests on the Secretary. The situation is something like the one which confronted two celebrated characters whom you probably remember were discussing whom they would call in case they got sick. It was in the time when Christian Science was in its heyday, and after getting along in their discussion, they were trying to decide whether they would call the Doctor or a Christian Scientist. So after a while one of them sized it up this way—"If the Christian Scientist had a little more science and the doctor had a little more Christianity, then it wouldn't make much difference which one you called, provided you had a good nurse."

There is an ancient adage which says that a prophet is not without honor save in his own country and among his own people. Tonight we wish to modify that. We want to apply if you will a statute of limitations. We want to make it read, at least, that a prophet is not without honor save in his own country for twenty-five years, Doctor Williamson has acted as our Secretary for all this length of time. He has given unstintedly of his time, and he has an interest in the welfare of this organization that I do not believe any one else would care to undertake. It is not an appointment; it is just simply a job that has to be taken care of. And so tonight, Doctor Williamson, we want to tender to you an expression of our esteem and appreciation for the long, continued, faithful and honored services you have rendered over a period of twenty-five years. I will ask Doctor Sihler to make the presentation.

Dr. Sihler: Mr. Toastmaster, Mr. President, ladies and gentlemen:

Before I enter into the main subject tonight, I would like to discuss Sections 4 and 5 of the Social Security League that our President was speaking about just a few moments ago. There is a problem as you know that comes up before us all, and it reminds me of a story I heard sometime ago. I will have to delete the story somewhat because while sitting here, I noticed eight or ten leave the hall, and I tried to formulate their age. I wanted to go too but I didn't dare to, so I am going to make my speech just a trifle short, and you fellows are going to be the losers.

(Gift from former and present members of the Examining Board, presented to Doctor Williamson.)

George, I am going to present you a little sentiment from your associates on the Board of Examiners, and I am sure that to me it is a greater pleasure to present it than it is to a Scotchman to receive it.

Dr. Williamson: Mr. President, Members of the Board of Examiners, Members of the Association:

I don't know what to say about this one-act play. I didn't know anything about it. I haven't had a chance to prepare any speech or anything of the kind. True, I have served long years—twenty-five years is a pretty good length of time to serve. I might say that there is only one man in the Federation of State Medical Examining Boards who has served longer than myself. That is Secretary Nye from Vermont, who is eighty-four or eighty-five years of age. If I can last a few years longer, I will beat him all to pieces. I guess he is one year ahead of me.

Now, after serving all these years, fellow members of the Association, many of you men who are sitting around here will find my name appearing on your state license. I hardly know what to say, but I have gone along and did the best I could. I know I haven't been able to please everybody; as I said to some of the fellows, a good many bricks have been shied at my head, and they have hit, bounded off, and haven't left many scars. I have gone along for these many years; have served to the best of my ability, given my best to the State Medical Association, and have enjoyed doing it. I think I have been mixed up in everything the Association has done. We got the law through in 1911, helped to write the constitution under which we are working today, and everything else connected with medicine in this state since 1911. I might call it my hobby, I have enjoyed it, and I just hope I will be able to go along for a few years more. I enjoy these meetings; I enjoy coming here year after year; I don't know when I have ever missed a meeting.

I might say I came to this country from Canada. I was brought up in a Puritanical community and if I have fallen any, by Jove, it's you fellows who are to blame. I remember the first medical meeting I was at in Grand Forks. Charlie MacLachlan was there. We had a meeting which was held in the top of the First National Bank Building on a hot afternoon in May, and I was a young fellow like some of these very young boys here now. I thought these medical men were great fellows. Somebody read a paper along in the middle of the afternoon, about half past three. When the paper was completed, some one arose and said, "Mr. President, I move that we adjourn to Franklin's Saloon on the East Side and discuss the paper over there." Now fellows, there were a dozen different seconds, and then those men got up and walked down the stairs and over across the bridge to Franklin's Saloon. I followed them and my, I felt ashamed. We went into the saloon and I think it was premeditated, because here was a great place opened up, and beer and whiskey on the table. The discussion started, but after a while I left; however, I think the discussion went along until toward morning. I was pretty young in those days and couldn't stand it.

I thought tonight as we were eating, everybody seemed to be merry, and this thought came to my mind, that all my lifetime I have not liked a fighting drunk; I have not liked a sobbing or a crying drunk, but I do enjoy a singing drunk. And so I thought tonight, everybody is having a good time and, by Jove, I was enjoying myself with the rest of them. We are all birds of a feather; we get together once a year, and when I go away tomorrow night, I will say good-bye, and hope that we shall all meet in Grand Forks next year. We will try and show you a good time, it is going to be our Fiftieth Jubilee, the fiftieth year since the organization of this society. I want you all to come to Grand Forks and we promise you to do our best to give you a good time. I hope to be there, feeling as good as I am now.

A VOICE: Is Franklin's Saloon there?

DR. WILLIAMSON: You would be surprised if I told you that I had not been in one of these beer joints or night clubs, or whatever you call them. When I go away from home I try to have a good time, but since these beer parlors and road houses have opened up, I haven't been inside of one of them. I just feel that I have arrived at the time of life when I don't want the young boys and girls, their mothers for whom I was physician when they were born, to see me in such places.

DR. GREENE: They do say that open confession is good for the soul.

The next number that we have is our scientific number for tonight, "Modern Methods in Tuberculosis Control," by Dr. J. A. Myers, Professor of Preventive Medicine, University of Minnesota.

DR. MYERS: I don't know how I can ever thank this Association sufficiently for the invitation to attend this meeting. It has been one of the finest days and finest evenings I have ever experienced. As I listened to the address of your President, I was hoping that a provision would be made whereby that address would be published in the Journal of the American Medical Association, so that every doctor in the country who is a member of the American Medical Association could read it. Doctor McCannel pointed out what the medical profession has done for the health of this country. If we go back to 1860, we find the average length of life was just forty years. Now it is approximately sixty years. That means for the boys and girls of this country, for every 100 of them an increase of 2,000 years of life, and when we come to analyze we find that the increase in the span of life in the United States has been brought about largely through the control of the communicable diseases, for which control the medical profession has been responsible. We see diphtheria pretty well brought under control; typhoid fever, and smallpox; and I would just like to, in this discussion, point out how through the control of another communicable disease we can increase still further the span of life in this country. Last year there were 55,000 persons lost their lives from tuberculosis. New Zealand now has a span of life of approximately 68 years. What has been done in New Zealand can be accomplished in the United States.

(Dr. Myers then gave his paper, fully illustrated by screen pictures, on "Modern Methods in Control of Tuberculosis.")

DR. GREENE: I am sure that I express the thanks of the Association to Doctor Myers for his clear, concise, and illuminative presentation of this subject. It has been a vital interest to all of us.

The hour is getting a little late. We have one more important subject to present to you and as soon as Doctor Larson can get here, who is chairman of the Legislative Committee of the Association, he will present "Legislative Prospects" to you. This is very interesting; you should pay attention to every word of it, because there is meat in it, and we want you to take it home and work on it.

(Dr. L. W. Larson then read his paper entitled "Legislative Prospects.")

DR. GREENE, continuing:

I think you will all agree that Doctor Larson has given us some good pointers in practical politics. If we do not fight for what we have; if we do not keep what we have; how in God's name can we ever expect to improve our condition, and get more than we have now. Take that home and remember it.

Upon motion duly made, seconded and carried, the meeting adjourned until 9:00 A. M., May 19.

SECOND DAY

Tuesday, May 19—Morning

The Association re-convened, and was called to order at 9:15 A. M., by the President, Doctor A. D. McCannel, of Minot.

Dr. H. M. Berg, Bismarck, North Dakota, used slides to illustrate the subject of "Radiographic Studies of Fractures of the Extremities."

Dr. E. G. Wakefield of Rochester, Minnesota, addressed the Society on "Physiology of the Colon with Medical Aspects of Carcinoma."

Dr. Harry Weber of Rochester, Minnesota, discussed the subject "X-ray Manifestations of Carcinoma of the Colon." Doctor Weber spoke in place of Dr. C. W. Mayo, who, being ill, was unable to appear on the program.

The President announced that the order of the program would be altered somewhat; that inasmuch as Doctor Michelson must return on the noon train, Doctor Weible had consented to present his paper after the noon adjournment.

Doctor Henry Michelson of Minneapolis, Minnesota, read a paper, which was illustrated with slides, on "Common Skin Diseases."

The meeting adjourned at 12 M., to re-convene at 2:00 P. M.

SECOND DAY

Afternoon

The Association re-convened at 2:00 P. M., and was called to order by the President, Dr. A. D. McCannel, Minot.

Dr. McCannel: According to our By-laws and constitution of the North Dakota State Medical Association, the hour has arrived that I turn over the gavel to the President for the incoming year.

I want to take this opportunity of thanking the members of the Association for the splendid co-operation they have given me and the other officers the past year. I bespeak for Bill Gerrish, the incoming President, this same co-operation.

Dr. Gerrish: Mr. President and fellow members: I do not care to attempt a speech, but I do want to assure you that I sincerely appreciate the honor bestowed upon me. I will try to warrant it.

Dr. R. E. Weible, of Fargo, North Dakota, read a paper on "Diverticulitis of the Colon." This paper was carried over from the morning program.

Dr. G. E. Hudson, of Minneapolis, Minnesota, discussed the subject "Endocrine Therapy in Gynecology."

Dr. F. A. Willius of Rochester, Minnesota, presented a paper on "Prognosis in Coronary Thrombosis."

Dr. Donald McCarthy of Minneapolis, Minnesota, spoke on "Coronary Artery Disease."

Dr. F. C. Rodda of Minneapolis, Minnesota, delivered an address on "Artificial Feeding in the New Born."

Dr. F. E. B. Foley of St. Paul, Minnesota, discussed the subject "Surgical Treatment of Hydronephrosis."

President Gerrish, on behalf of the Association, thanked the guest speakers for their courtesy in contributing to the program. He also thanked the immediate past President and the different committees for their contribution toward the success of the meeting.

The Forty-ninth Annual Session of the North Dakota Medical Association adjourned at 5:00 P. M. sine die.

PRIZES

Golf

First—Dr. G. H. Holt, Jamestown.
Second—Dr. A. R. Sorenson, Minot.
Third—Dr. F. W. Fergusson, Kulm.

Special

Dr. C. E. Stackhouse, Bismarck.
Dr. R. W. Pence, Minot.

A. W. Skelsey, M.D.,
Secretary.

DISTRICT AND COUNTY ROSTER

CASS COUNTY MEDICAL SOCIETY

PRESIDENT
Limburg, A. M..........Fargo

SECRETARY-TREASURER
Watson, E. M..............Fargo

Aylen, J. P. ....Grafton
Baillie, W. F.............Fargo
Barnes, N. J. ....Fargo
Boerth, E. H............Buffalo
Bray, R. B...............Fargo
Brown, R. C...............Fargo
Brown, W. G..............Fargo
Burton, P. H.............Fargo
Clay, A. J..................Fargo
Darrow, F. L ....Fargo
Darrow, K. E. ....Fargo
Dillon, J. G. ....Fargo
Dodds, G. A..........San Haven
Evans, L. J......New York City
Elofson, C. E. ....Fargo
Fjelde, J. H. ....Fargo
Floew, A. T. ....Fargo
Fortin, H. J. ....Fargo
Fortney, A. C..............Fargo
Foster, G. C. ....Fargo
Hanna, J. F................Fargo
Haugen, H...............Fargo
Haugrud, E. M. ....Fargo
Haynes, G. H...........Lisbon
Heimark, A. J............Fargo
Hendrickson, G. ....Enderlin
Hotchkiss, Wm...........Fargo
Hunter, G. W. ....Fargo
Huntley, H. B. ....Kindred
Ivers, G. U. ....Fargo
James, J. B...............Page
Jelstrup, C...........Petersburg
Joistad, Arthur H.........Fargo
Kaess, A. J.................Fargo
Lancaster, W. E. G.........Fargo
Larson, G. A.............Fargo
Lewis, T. H.............Fargo
Limburg, A. M...........Fargo
Long, W. H. ....Fargo
MacGregor, M...........Fargo
Miller, H. W.........Casselton
Morris, A. C.............Fargo
Nichols, A. A. ....Fargo
Nichols, W. C............Fargo
Oftedal, Axel ....Fargo
Oftedal, Sverre...........Fargo
Ostfield, J. R..............Fargo
Patterson, T. C..........Lisbon
Pray, R. E. ....Fargo
Richter, E. H...........Hunter
Rindlaub, Elizh. P..........Fargo
Rostel, Hugo.............Fargo
Rothnem, T. P...........Fargo
Sand, O. ....Fargo
Skarshaug, H. J...........Fargo
Skelsey, A. W............Fargo
Stafne, W. A. ....Fargo
Stolinsky, A. ....Lisbon
Swanson, J. C............Fargo
Tainter, R. ....Fargo
Tronnes, N. ....Fargo
Watson, E. M.............Fargo
Weible, R. E...............Fargo
Winn, W. R. ....Fargo

DEVILS LAKE DISTRICT MEDICAL SOCIETY

PRESIDENT
Toomey, G...........Devils Lake

SECRETARY-TREASURER
Drew, G. F.........Devils Lake

Arneson, A. O. ....McVille
Bartle, J. P...........San Haven
*Beck, R. H...............Lakota
Call, A. M................Rugby
Dodds, G. A. ....San Haven
Drew, G. F.........Devils Lake
Engesather, J. A. D.....Brocket
Fawcett, J. C.........Devils Lake
Fawcett, N. W........Devils Lake
Fawcett, W. C.....Starkweather
Graham, J. D.......Devils Lake
Greengard, M. ....Cando
Horsman, A. T......Devils Lake
Laugeson, L.....San Diego, Calf.
Lees, H. D. ....Philadelphia
MacDonald, J. A. ....Cando
McGurren, C. J....Devils Lake
McIntosh, G. J.....Devils Lake
Mattson, R. H.........McVille
Olafson, K. ....Cando
Sedlacek, B. B......Fort Totten
Sihler, W. F.........Devils Lake
Smith, C...........Devils Lake
Stickelberger, J.........Oberon
Toomey, G. W. ......Devils Lake
Verrett, B. D. ....Rolla
Vigeland, J. G........Brinsmade
Widmeyer, J. P...........Rolla

*Deceased

GRAND FORKS DISTRICT MEDICAL SOCIETY

PRESIDENT
Ruud, H. O........Grand Forks

SECRETARY
Woutat, P. H........Grand Forks

TREASURER
Benwell, H. D.......Grand Forks

Alger, L. J.........Grand Forks
Benson, T. Q.......Grand Forks
Bentzen, Olaf ......Grand Forks
Benwell, H. D.......Grand Forks
Campbell, R. D.....Grand Forks
Countryman, G. L. ......Grafton
Countryman, J. E.......Grafton
Deason, F. W...........Grafton
Eggers, Aug.......Grand Forks
Field, A. B........Forest River
Flaten, A. N..........Edinburg
French, H. E.......Grand Forks
Glaspel, C. J...........Grafton
Glaspel, G. W..........Grafton
Goehl, R. O. ....Grand Forks
*Grassick, James....Grand Forks
Haagenson, E. C.....Grand Forks
Halldorson, M. B., Winnipeg, Can.
Hardy, N. A.............Minto
Haugen, C. O..........Larimore
Hofto, J. M........Grand Forks
Irvine, V. S.........Park River
Landry, L. H..........Walhalla
Law, H. W. F.....Grand Forks
Leigh, R. E........Grand Forks
Liebeler, W. A.....Grand Forks
Lohrbauer, L. T...Grand Forks
Lommen, C. E. ....Fordville
McQueen, W. W.......Langdon
Mahon, R. M.......Grand Forks
Miller, J. P........Grand Forks
Moore, J. H........Grand Forks
Mulder, J. L...........Cavalier
Mulligan, T.......Grand Forks
Mulligan, V. A. ....Langdon
Muns, O. H.......Grand Forks
O'Keefe, H. ....Grand Forks
Panek, A. F.............Milton
Peake, M. F.......Grand Forks
Quale, V. S. ....Grand Forks
Rand, C. C. ....Crystal
Ruud, H. O. ....Grand Forks
Ruud, M. B. ....Grand Forks
Rystad, O. H.........Grand Forks
Stratte, J. J. ....Grand Forks
Stromberg, G. E........Langdon
Thompson, A. Y.......Larimore
Thorgrimsen, G. G..Grand Forks
Tompkins, C. R.........Grafton
Vance, R. W.........Northwood
Wagar, W. D.........Michigan
Waldren, Geo...........Pembina
Waldren, H. M., Sr. .....Drayton
Waldren, H. M., Jr.....Drayton
Weed, F. E.........Park River
Williamson, G. M...Grand Forks
Witherstine, W. H..Grand Forks
Woutat, P. H. ......Grand Forks
Youngs, N. A. ......Grand Forks

*Honorary

KOTANA MEDICAL SOCIETY

PRESIDENT
Zeiss, E. J..............Wildrose

SECRETARY-TREASURER
AbPlanalp, Ira S........Williston

AbPlanalp, Ira S........Williston
Craven, J. P...........Williston
Dochterman, L. B.....Williston
Hoeper, P. G. E.........Williston
Johnson, P. O. C...Watford City
Jones, C. S...........Williston
Owenson, H. A. ....Arnegard
Schwinghamer, E. J......Grenora
Skovholt, H. T........Williston
Wright, W. A.........Williston
Zeiss, E. J.............Wildrose

NORTHWEST DISTRICT MEDICAL SOCIETY

PRESIDENT
Rowe, P. H...............Minot

SECRETARY-TREASURER
Pence, J. R...............Minot

Blatherwick, W. E....Van Hook
Breslich, P. J. ....Minot
Cameron, A. L...........Minot
Carr, A. ....Minot
Carr, A. M...............Minot
Cowan, J. A............Kenmare
Craise, O. S.............Towner
Dalager, N. O.......Anamoose
Devine, J. L.............Minot
Dyson, R. E...............Minot
Erenfield, H. M. ....Minot
Fardy, M. J...............Minot
Flath, M. G.............Stanley
Frogner, G. S. ....Parshall
Garrison, M. W..........Minot
Gillespie, D. R............Mohall
Goodman, Robt......Powers Lake
Grangaard, H. O.........Ryder
Greene, E. E..........Westhope
Halliday, D. J...........Kenmare
Halverson, H. L..........Minot
Hansen, C. O.............Minot
Hanson, G. C.............Minot
Haraldson, O.............Minot
Hayhurst, J. O............Rolette
Hillis, S. J.............Berthold
Ittkin, Paul...............Tolley
Jensen, A. F.............Rugby
Johnson, J. A..........Bottineau
Kempthorne, C. R.........Minot
Kermott, L. H...........Minot
Kolb, F. K............Granville
Krogstad, L. T............Minot
Lampert, M. T............Minot
McCannel, A. D.........Minot
Moffat, George..........Crosby
Nelson, L. F...........Bottineau
Newlove, J. T.............Minot
O'Neil, R. T. ....Minot
Pence, J. R...............Minot
Pence, R. W.............Minot
Rainville, S. ....Crosby
Ransom, E M...........Minot
Robertson, C. W. ....Minot
Rollie, C. O................Drake
Rowe, P. H................Minot
Seiffert, G. S...............Minot
Smith, J. A. ....Noonan
Sorenson, A. R...........Minot
Timm, J. F.............Makoti
Weeks, S. A. ....Ambrose
Wheelon, F. E...........Minot
Yeomans, T. N...........Minot

RICHLAND COUNTY MEDICAL SOCIETY

PRESIDENT
Thane, Benj............Wahpeton

SECRETARY-TREASURER
Hoskins, J. H..........Wahpeton

Bateman, C. V. ....Wahpeton
Beithon, E. J. ....Hankinson
Hoskins, J. H..........Wahpeton
Landers, C. H.....Altadena, Calf.
Miller, H. H...........Wahpeton
Olson, C. T. ....Wyndmere
Pangman, W. J.........Wahpeton
Reiswig, A. H. ....Fairmount
Sasse, E. G...........Lidgerwood
Thane, B. ....Wahpeton
Thompson, A. M.......Wahpeton
Weible, E. B.........Abercrombie

SHEYENNE VALLEY MEDICAL SOCIETY

PRESIDENT
Brown, Fred.........Valley City

SECRETARY-TREASURER
Moore, Will. H........Valley City

Almklov, L........Cooperstown
Brown, Fred........Valley City
Campbell, W.......Valley City
Helseth, H. K...........Litchville
Macdonald, A. C.....Valley City
Macdonald, A. W....Valley City
Meredith, C. J.......Valley City
Moore, Will H.......Valley City
Nelson, J. M..........Valley City
Platou, C. A........Valley City
Pray, E. A.........Valley City
VanHouten, J.......Valley City
Westley, M. D.....Cooperstown
Wicks, Fred L......Valley City
Zimmerman, S. A....Valley City

SIXTH DISTRICT MEDICAL SOCIETY

PRESIDENT
Eastman, L. G............Hazen

SECRETARY-TREASURER
Larson, L. W.........Bismarck

Arneson, C. A. ....Bismarck
Arnson, J. O.........Bismarck
Baer, DeWitt............Steele
Benson, O. T.........Glen Ullin
Berg, H. M...........Bismarck
Bodenstab, W. H......Bismarck
Brandes, H. A.........Bismarck
Brandt, A. M..........Bismarck
Brink, Norvel ....Bismarck
Buckingham, T. W. ....Bismarck
Bunting, F. E..........Mandan
Constans, G. M.......Bismarck
Diven, W. L..........Bismarck
Eastman, L. G...........Hazen
Fisher, A. M..........Bismarck
Fredricks, L. H.......Bismarck
Freise, P. W. ....Bismarck
Gaebe, O. C.........New Salem
Gerdes, Maude.......Minneapolis
Gordon, W. L........Washburn
Griebenow, F. F.......Bismarck
Halliday, A. B. ....Hebron
Hamilton, E. E.....New Leipzig
Heinzroth, G.........Turtle Lake
Henderson, R. W......Bismarck
Hetzler, A. E. ....Mandan
LaRose, V. J..........Bismarck
Larson, E. J. ....Underwood
Larson, L. W.........Bismarck
Lipp, G. R............Bismarck
Monteith, George......Hazelton
Moyer, L. B.............Carson
Nickerson, B. S.........Mandan
Owens, P. L...........Bismarck
Pierce, W. B..........Bismarck
Quain, E. P...........Bismarck

Quain, F. D...........Bismarck
Radl, R. B.............Bismarck
Ramstad, N. O........Bismarck
Rassmussen, F. P........Beulah
Rice, P. F.................Solen
Roan, M. W..........Bismarck
Rogne, W. G. ....McClusky
Rosenberger, H. P.......Bismarck
Schatz, G. ....Linton
Schoregge, C. W.......Bismarck
Shepard, W. B.............Linton
Smith, C. C.............Mandan
Smith, L. G.............Mandan
Spielman, G. H.........Mandan
Stackhouse, C. E.....Bismarck
Strauss, F. B..........Bismarck
Thompson, R. C ....Bismarck
Vonnegut, F. F. ....Hague
Waldschmidt, R. H....Bismarck
Weston, D. T. ....Mandan
Weyrens, P. J...........Hebron
Whittemore, A. A. .....Napoleon
Williams, Maysil ....Bismarck

SOUTHERN DISTRICT MEDICAL SOCIETY

PRESIDENT

Sherman, C. H............Oakes

SECRETARY-TREASURER

Fergusson, F. W.........Kulm

Emanuel, H. W.........Milnor
Fergusson, F. W.........Kulm
Grant, George..........Wishek
Greene, L. B...........Edgeley
Lyle, W. D. ....Havana
Lynde, Roy..........Ellendale
Merrett, J. P.............Marion
Miller, S................Ellendale
Ribble, George B. ......LaMoure
Sherman, C. H. ....Oakes
Van Houten, R. ....Oakes

SOUTHWESTERN DISTRICT MEDICAL SOCIETY

PRESIDENT

Schumacher, N. W.....Hettinger

SECRETARY-TREASURER

Spear, A. E...........Dickinson

Bowen, Jesse W.......Dickinson
Bradley, W. C............Beach
Chernausek, S........Dickinson
Cornelius, F. J.........Bowman
Dach, J. L...............Reeder
Dukart, C. R.........Richardton
Gilsdorf, W. H. ....New England
Gumper, A. J..........Dickinson
Gumper, J. B...........Belfield
Heffron, M. M.........Dickinson
Hill, S. W...............Regent
Law, I. M.............Halliday
Lemieux, D. ....Stanley
Lyons, M. W..............Beach
Maercklein, O. C. ....Mott
Morris, V. G. ....Beach
Murray, K. M.........Scranton
Nachtwey, A. P. ......Dickinson
Olesky, E.................Mott
Patterson, Stanley.......Rhame
Perkins, G. A.........Dickinson
Reichert, H. L. ....Dickinson
Rodgers, R. W.........Dickinson
Schumacher, N. W....Hettinger
Smith, Oscar M.........Killdeer
Spear, A. E...........Dickinson
Williams, M. F. ....Hettinger

STUTSMAN COUNTY MEDICAL SOCIETY

PRESIDENT

Brainard, Bertha......Jamestown

SECRETARY-TREASURER

Conrad, J. L. ....Jamestown

Arzt, P. G...........Jamestown
Brainard, Bertha B....Jamestown
Cabot, G. S...........Jamestown
Carpenter, G. S.......Jamestown
Carr, Agnes Thorpe...Jamestown
Carr, J. D...........Jamestown
Conrad, J. L.........Jamestown
Culbert, M. H...........Courtney
DePuy, T. L.........Jamestown
Fergusson, V. O...........Gackle
Fitzpatrick, J. C.......Jamestown
Gerrish, W. A.......Jamestown
Holt, G. H............Jamestown
Lawton, V. C..........Jamestown
Longstreth, W. E. ....Kensal
Melzer, S. W.......Woodworth
Nierling, R. O........Jamestown
Peake, Francis ....Jamestown
Regan, J..............Jamestown
Sorkness, Joseph....Jamestown
Wood, W. W........Jamestown
Woodward, F. O.....Jamestown

TRAILL-STEELE COUNTY MEDICAL SOCIETY

PRESIDENT

Little, R. C.............Mayville

SECRETARY-TREASURER

Vinje, Syver..........Hillsboro

Cuthbert, W. H.......Hillsboro
Hjelle, C. A...........Portland
Kjelland, A. A...........Hatton
Knutson, O. A. ....Buxton
Little, R. C. ....Mayville
Odegaard, Bernt.......Mayville
Savre, M. T.........Northwood
Vinje, Syver..........Hillsboro

TRI-COUNTY MEDICAL SOCIETY

PRESIDENT

Matthaei, D. W.........Fessenden

SECRETARY-TREASURER

Hammargren, A. F........Harvey

Boyum, P. A.............Harvey
Crawford, John..New Rockford
Donker, A. E..........Carrington
Goss, E. L. ....Carrington
Hammargren, A. F......Harvey
MacLachlan, Chas.....San Haven
Matthaei, D. W.......Fessenden
Matthaei, Pearl.......Jamestown
Owens, C. G. ....Sheyenne
Seibel, J. J..............Harvey
Van de Erve, H. ......Carrington
Westervelt, A. E.......Bowden

ALPHABETICAL ROSTER

AbPlanalp, Ira S......Williston
Almklov, L........Cooperstown
Alger, L. J. ....Grand Forks
Arneson, A. O..........McVille
Arneson, C. A...........Bismarck
Arnson, J. O..........Bismarck
Arzt, Philip G.......Jamestown
Aylen, James Prentiss....Grafton
Baer, DeWitt............Steele
Baillie, W. F.............Fargo
Barnes, N. J. ....Fargo
Bartle, J. P...........San Haven
Bateman, C. V.........Wahpeton
†Beek, R. Hudson........Lakota
Beithon, E. J. ....Hankinson
Benson, O. T.........Glen Ullin
Benson, T. Q........Grand Forks
Bentzen, Olaf ......Grand Forks
Benwell, H. D.......Grand Forks
Berg, H. M...........Bismarck
Blatherwick, W. E....Van Hook
Bodenstab, W. H......Bismarck
Boerth, E. H.............Buffalo
Bowen, J. W..........Dickinson
Boyum, P. A.............Harvey
Bradley, W. C............Beach
Brainard, Bertha B. ..Jamestown
Brandes, H. A.........Bismarck
Brandt, Albert M.....Bismarck
Bray, R. B...............Fargo
Breslich, P. J. ....Minot
Brink, Norvel ....Bismarck
Brown, Fred........Valley City
Brown, R. C...............Fargo
Brown, W. G..............Fargo
Buckingham, T. W. ....Bismarck
Bunting, Frank E........Mandan
Burton, Paul H...........Fargo
Cabot, G. S...........Jamestown
Call, A. M...............Rugby
Cameron, A. L...........Minot
Campbell, R. D.....Grand Forks
Campbell, William...Valley City
Carpenter, G. S.......Jamestown
Carr, A. ....Minot
Carr, Agnes Thorpe...Jamestown
Carr, Andy M.............Minot
Carr, John D.........Jamestown
Chernausek, S.........Dickinson
Clay, A. J..................Fargo
Conrad, J. L.........Jamestown
Constans, Geo. M......Bismarck
Cornelius, F. J.........Bowman
Countryman, G. L........Grafton
Countryman, J. E.......Grafton
Cowan, J. A............Kenmare
Craise, O. S.............Towner
Craven, J. P...........Williston
Crawford, John...New Rockford
Culbert, M. H...........Courtney
Cuthbert, W. H.......Hillsboro
Dach, John L............Reeder
Dalager, N. O........Anamoose
Darrow, F. I. ....Fargo
Darrow, K. E. ....Fargo
Deason, Frank W.......Grafton
DePuy, T. L.........Jamestown
Devine, J. L..............Minot
Dillon, J. G. ....Fargo
Diven, W. L..........Bismarck

Dochterman, L. B......Williston
Dodds, G. A..........San Haven
Donker, A. E.........Carrington
Drew, G. F.........Devils Lake
Dukart, C. R..........Richardton
Dyson, R. E...............Minot
Eastman, L. G...........Hazen
Eggers, August S...Grand Forks
Elofson, C. E. ....Fargo
Emanuel, H. W.........Milnor
Engesather, J. A. D.....Brocket
Erenfield, H. M. ....Minot
Evans, L. J.....New York, N. Y.
Fardy, Martin J...........Minot
Fawcett, J. C.......Devils Lake
Fawcett, N. W........Devils Lake
Fawcett, W. C.....Starkweather
Fergusson, V. O.........Gackle
Fergusson, F. W..........Kulm
Field, A. B.........Forest River
Fisher, Albert M......Bismarck
Fitzpatrick, J. C.......Jamestown
Fjelde, J. H. ....Fargo
Flaten, A. N. ....Edinburg
Flath, M. G.............Stanley
Floew, A. T. ....Fargo
Fortin, H. J. ....Fargo
Fortney, A. C.............Fargo
Foster, G. C. ....Fargo
Fredricks, L. H.......Bismarck
Freise, P. W. ....Bismarck
French, H. E.......Grand Forks
Frogner, G. S. ....Parshall
Gaebe, O. C.........New Salem
Garrison, M. W...........Minot
Gerdes, Maude M.....Minneapolis
Gerrish, W. A........Jamestown
Gillespie, D. R...........Mohall
Gilsdorf, Walter H..New England
Glaspel, C. J...........Grafton
Glaspel, G. W...........Grafton
Goehl, R. O. ....Grand Forks
Goodman, Robt.....Powers Lake
Gordon, W. L..........Washburn
Goss, E. L.............Carrington
Graham, J. D.......Devils Lake
Grangaard, Henry O......Ryder
Grant, George..........Wishek
*Grassick, James..Grand Forks
Greene, E. E. ....Westhope
Greene, Lee B..........Edgeley
Greengard, M. ....Cando
Griebenow, F..........Bismarck
Gumper, A. J..........Dickinson
Gumper, J. B...........Belfield
Haagenson, E. C.....Grand Forks
Halldorson, M. B..Winnipeg, Can.
Halliday, A. B. ....Hebron
Halliday, D. J...........Kenmare
Halverson, Henry L.......Minot
Hamilton, E. E.....New Leipzig
Hammargren, A. F......Harvey
Hanna, J. F................Fargo
Hansen, C. O.............Minot
Hanson, Geo. C...........Minot
Haraldson, O. ....Minot
Hardy, N. A.............Minto
Haugen, C. O.........Larimore
Haugen, H................Fargo
Haugrud, E. M. ....Fargo

Hayhurst, J. O...........Rollette
Haynes, G. H...........Lisbon
Heffron, M. M..........Dickinson
Heimark, A. J...........Fargo
Heinzeroth, G. E.....Turtle Lake
Helseth, H. K..........Litchville
Henderson, R. W. ......Bismarck
Henrickson, G. ....Enderlin
Hetzler, A. E. ....Mandan
Hill, S. W...............Regent
Hillis, S. J.............Berthold
Hjelle, Carl A..........Portland
Hoeper, P. G. E.........Williston
Hofto, J. M........Grand Forks
Holt, George H.....Jamestown
Horsman, A. T.....Devils Lake
Hoskins, J. H..........Wahpeton
Hotchkiss, W. M.........Fargo
Hunter, G. W.............Fargo
Huntley, H. B. ....Kindred
Irvine, Vincent S....Park River
Ittkin, P...................Tolley
Ivers, G. U. ....Fargo
James, J. B...............Page
Jelstrup, C............Petersburg
Jensen, August F........Rugby
Johnson, J. A..........Bottineau
Johnson, P. O. C...Watford City
Joistad, A. H.............Fargo
Jones, Carlos S........Williston
Kaess, A. J. ....Fargo
Kempthorne, C............Minot
Kermott, Louis H.........Minot
Kjelland, A. A...........Hatton
Knutson, O. A..........Buxton
Kolb, F. K............Granville
Krogstad, L. T............Minot
Lampert, M. T............Minot
LaRose, Victor J......Bismarck
Lancaster, W. E. G.........Fargo
Landers, C. H.....Altadena, Calif.
Landry, L. H..........Walhalla
Larson, E. J. ....Underwood
Larson, G. A.............Fargo
Larson, L. W.........Bismarck
Laugeson, L. M..San Diego, Calif.
Law, H. W. F.....Grand Forks
Law, I. M..............Halliday
Lawton, V. C.........Jamestown
Lees, H. D......Philadelphia, Pa.
Leigh, R. E........Grand Forks
Lemieux, D. ....Stanley
Lewis, T. H..............Fargo
Liebeler, W. A.....Grand Forks
Limburg, A. M...........Fargo
Lipp, G. R............Bismarck
Little, R. C............Mayville
Lohrbauer, L. T....Grand Forks
Lommen, C. E. ....Fordville
Long, W. H. ....Fargo
Longstreth, W. E. ....Kensal
Lyle, W. D..............Havana
Lynde, Roy ....Ellendale
Lyons, M. W.......Sentinel Butte
MacDonald, A. C.....Valley City
MacDonald, A. W.....Valley City
MacDonald, J. A. ....Cando
MacGregor, M............Fargo
MacLachlan, Chas.....San Haven
McCannel, A. D..........Minot

*Honorary
†Deceased

McGurren, C. J.	Devils Lake
McIntosh, G. J.	Devils Lake
McQueen, W. W.	Langdon
Maercklein, O. C.	Mott
Mahon, Ruth M.	Grand Forks
Matthaei, D. W.	Fessenden
Matthaei, Pearl V.	Jamestown
Mattson, Roger H.	McVille
Melzer, S. W.	Woodworth
Meredith, C. J.	Valley City
Merrett, J. P.	Marion
Miller, H. H.	Wahpeton
Miller, H. W.	Casselton
Miller, J. P.	Grand Forks
Miller, Samuel	Ellendale
Moffat, George	Crosby
Monteith, G.	Hazelton
Moore, J. H.	Grand Forks
Moore, Will H.	Valley City
Morris, A. C.	Fargo
Morris, V. G.	Beach
Moyer, L. B.	Carson
Mulder, J. L.	Cavalier
Mulligan, T.	Grand Forks
Mulligan, V. A.	Langdon
Murray, K. M.	Scranton
Muus, H. O.	Grand Forks
Nachtwey, A. P.	Dickinson
Nelson, J. M.	Valley City
Nelson, L. F.	Bottineau
Newlove, J. T.	Minot
Nichols, A. A.	Fargo
Nichols, W. C.	Fargo
Nickerson, B. S.	Mandan
Nierling, R. O.	Jamestown
O'Keefe, H.	Grand Forks
O'Neil, R. T.	Minot
Odegaard, B.	Mayville
Oftedal, Axel	Fargo
Oftedal, Sverre	Fargo
Olafson, K.	Cando
Olesky, E.	Mott
Olson, C. T.	Wyndmere
Ostfield, J. R.	Fargo
Owens, C. G.	Sheyenne
Owens, P. L.	Bismarck
Owenson, H. A.	Arnegard
Panek, A. F.	Milton
Pangman, W. J.	Wahpeton
Patterson, S.	Rhame
Patterson, T. C.	Lisbon
Peake, Francis	Jamestown
Peake, M. F.	Grand Forks
Pence, J. R.	Minot
Pence, R. W.	Minot
Perkins, G. A.	Dickinson
Pierce, W. B.	Bismarck
Platou, C. A.	Valley City
Pray, E. A.	Valley City
Pray, R. E.	Fargo
Quain, E. P.	Bismarck
Quain, Fannie Dunn	Bismarck
Quale, V. S.	Grand Forks
Radl, R. B.	Bismarck
Rainville, S.	Crosby
Ramstad, N. O.	Bismarck
Rand, C. C.	Crystal
Ransom, E. M.	Minot
Rasmussen, F. P.	Beulah
Regan, J. F.	Jamestown
Reichert, H. L.	Dickinson
Reiswig, A. H.	Fairmount
Ribble, George	LaMoure
Rice, P. F.	Solen
Richter, E. H.	Hunter
Rindlaub Elizh, P.	Fargo
Roan, M. W.	Bismarck
Robertson, C. W.	Jamestown
Rodgers, R. W.	Dickinson
Rogne, W. G.	McClusky
Rollie, C. O.	Drake
Rosenberger, H. P.	Bismarck
Rostel, Hugo	Fargo
Rothnem, T. P.	Fargo
Rowe, P. H.	Minot
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Rystad, O. H.	Grand Forks
Sand, O.	Fargo
Sasse, E. G.	Lidgerwood
Sayre, M. T.	Northwood
Schatz, G.	Linton
Schoregge, C. W.	Bismarck
Schumacher, N. W.	Hettinger
Schwinghamer, E. J.	Grenora
Sedlacek, B. B.	Fort Totten
Seibel, J. J.	Harvey
Seiffert, G. S.	Minot
Shepard, W. B.	Linton
Sherman, C. H.	Oakes
Sihler, W. F.	Devils Lake
Skarshaug, H. J.	Fargo
Skelsey, A. W.	Fargo
Skovholt, H. T.	Williston
Smith, C. C.	Mandan
Smith, C.	Devils Lake
Smith, J. A.	Noonan
Smith, LeRoy G.	Mandan
Smith, O. M.	Killdeer
Sorenson, A. R.	Minot
Sorkness, Joseph	Jamestown
Spear, A. E.	Dickinson
Spielman, G. H.	Mandan
Stackhouse, C. E.	Bismarck
Stafne, W. A.	Fargo
Stickelberger, J. S.	Oberon
Stolinsky, A.	Lisbon
Stratte, J. J.	Grand Forks
Strauss, F. B.	Bismarck
Stromberg, G. E.	Langdon
Swanson, J. C.	Fargo
Tainter, Rolfe	Fargo
Thane, B.	Wahpeton
Thompson, A. M.	Wahpeton
Thompson, A. Y.	Larimore
Thompson, R. C.	Wilton
Thorgrimsen, G. G.	Grand Forks
Timm, J. F.	Makoti
Tompkins, C. R.	Grafton
Toomey, G. W.	Devils Lake
Tronnes, N.	Fargo
Vance, R. W.	Northwood
Van de Erve, H.	Carrington
VanHouten, J.	Valley City
Vau Houten, R. W.	Oakes
Verrett, B. D.	Rolla
Vigeland, J. G.	Brinsmade
Vinje, Syver	Hillsboro
Vonnegut, F. F.	Hague
Wagar, W. D.	Michigan
Waldren, G. R.	Pembina
Waldren, H. M., Jr.	Drayton
Waldren, H. M., Sr.	Drayton
Waldschmidt, R. H.	Bismarck
Watson, E. M.	Fargo
Weed, F. E.	Park River
Weeks, S. A.	Ambrose
Weible, E. B.	Abercrombie
Weible, R. E.	Fargo
Westley, M. D.	Cooperstown
Westervelt, A. E.	Bowdon
Weston, D. T.	Mandan
Weyrens, P. J.	Hebron
Wheelon, F. E.	Minot
Whittemore, A. A.	Napoleon
Wicks, F. L.	Valley City
Widmeyer, J. P.	Rolla
Williams, M. F.	Hettinger
Williams, Maysil	Bismarck
Williamson, G. M.	Grand Forks
Winn, W. R.	Fargo
Witherstine, W. H.	Grand Forks
Wood, W. W.	Jamestown
Woodward, F. O.	Jamestown
Wouatt, P. H.	Grand Forks
Wright, W. A.	Williston
Yeomans, T. N.	Minot
Youngs, N. A.	Grand Forks
Zeiss, E. J.	Wildrose
Zimmerman, S. A.	Valley City

The Therapy of Eczema

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THE purpose of this contribution is briefly to review some of the conventional remedies and measures which experience, extending over a period of many years, have proved of value in the treatment of eczematous dermatoses encountered in every-day practice.

In this article we are dealing with the treatment of eczematous eruptions—i. e., eruptions characterized by polymorph lesions consisting of erythema, scaling, papules, vesicles, and at times lichenification, accompanied by more or less itching, in other words, with eczema in the widest sense.

The ability to select suitable remedies for the relief and care of different forms and various evolutionary stages of eczematous dermatoses, pre-supposes a certain degree of diagnostic skill. The more or less vexatious question as to whether the patient is afflicted with dermatitis or with eczema need not concern us here; many able dermatologists have fully considered the subject from all angles, but after much has been said and more has been written, the problem, broadly speaking, remains unchanged in so far as treatment is concerned. Suffice it to say that for practical purposes the designation "dermatitis" may be used to indicate certain forms of cutaneous inflammation in which external causes seem to be, or are proved to be, the exciting factors; these have been termed contact dermatitis, industrial, occupational and trade dermatitis, dermatitis venenata, and so forth; theoretically, such eruptions either improve or entirely subside when the suspected or established external sensitizing agents (usually of non-protein nature) are eliminated.

Eczema is not a disease entity. It is to be considered rather as a reaction-form, an allergic response on the part of a susceptible individual to some substance or substances to which he is sensitive. The shock organ, the site of reaction in eczema, is the epidermis, and the allergen, the causitive agent, may produce its effect by direct contact with the epidermis or may reach the epidermis by the vascular system after ingestion, injection or inhalation. This allergic conception would seem to bring eczema into line with other sensitizations, namely asthma, hay fever, atopic dermatitis, (disseminated neurodermite), and possibly urticaria, namely the "atopic" disease of Coca. Indeed, there are those who teach the unity of these processes. However, all evidence points away from any such explanation and tends to the contrary. The characteristics of the atopic diseases, namely the hereditary tendency, the not infrequent association of several atopic manifestations in the same individual, the positive scratch test elicited with numerous allergens, the demonstration of circulating antibodies are lacking in eczema. At least they are not present to any greater degree than can be accounted for by the theory of probability. While positive reactions can be elicited by means of the patch test in a great many cases of eczema, there has been to date no satisfactory demonstration of antibodies. The theory of sessile antibodies, attached to the cells of the epidermis, has been advanced, but this is a theory which remains to be proved.

The number of substances which may act as allergens is legion. Only the most common can be here mentioned and include: dyes, especially paraphenylene-diamine used in the fur industry and in the dyeing of hair; plants and flowers, such as primrose, poison ivy, and poison oak; insecticides, oils, essential oils, lacquers, petroleum; disinfectants; inorganic salts such as potassium bichromate, nickel sulphate, bichloride of mercury; woods, especially boxwood, teakwood and sandalwood. An individual presenting himself with an eczematous eruption must be questioned minutely for all possible sources of contact. The time, the patience and the ingenuity of both physician and patient will often be taxed to the extreme. In the unintelligent patient the search for the etiologic factor will often prove futile because of his inability to grasp the relationship between the incriminating contact and the eczematous eruption, and, therefore, a resultant inability to co-operate in the search for the offending agent.

The occupational eczemas form a sub-group in which the etiologic factor is more often determined than in sporadic cases, since more than one individual in the same industry is usually affected, and since the contact substances are known, are often more limited in number, and are more easily made available for testing.

The technique of testing for sensitivity to eczematogenous substances is only a logical sequence to the manner of action of the offending agent. The eruption appears as a result of contact with the epidermis, and so the test is one of contact. A concentration of the suspected substance such as will not injure the skin of a normal individual, is applied to an unaffected site under an occlusive dressing for 24 to 48 hours. At the end of that time the skin is observed for any eczematous changes. The reactions range from mild erythema to the formation of bullae and even necrosis with intervening stages of papule formation and vesiculation. The reaction may be delayed for 48 hours or longer, and in cases in which the tested material is strongly suspected, observation over a period of ten days may be required. This test is referred to as the contact or patch test.

We have thus far primarily considered those eczemas arising from contact. Unfortunately this forms only a small group of the cases of eczematous dermatitis which we are called upon to treat. It does not seem to be a matter of common knowledge that in a large heterogeneous clinical material, unselected cases of eczematous dermatitis, properly diagnosed, thoroughly questioned and tested by people trained in this particular type of work, yields only the discouraging figure of two per cent to four per cent positive reactions of clinical significance. In selected cases, that is in a group in which the history is strongly suggestive of contact, the figure may reach fifteen per cent (15%) of positive reactions of clinical significance.

What about the many cases in which no suggestive or significant reactions are elicited? What is their etiology? In our present state of knowledge we attribute these to several sources: (1) to undetermined sources of contact, (2) to products emanating from foci of infection and microorganisms, (3) to foods and split products of digestion; an extremely rare cause in our opinion, and (4) to sensitization to products of metabolism and other circulating endogenous substances. If a susceptible individual can react with an eczematous eruption to some environmental product, why not to some endogenous substance to which he has become sensitized? The reaction-form, eczema, will be produced as well from such substances as it will from arsphenamine or quinine artificially introduced and circulating in the blood stream. Irritation of a chronic patch of eczema will often be followed by the appearance of an acute vesicular eruption on other parts of the body. Whitfield attributed the appearance of this eruption to a sensitization of the epidermis to circulating tissue products resulting from the irritation of the primary focus. He referred to this phenomenon as auto-sensitization, a wholly satisfactory term which might well be applied to all eczemas attributed to endogenous substances and causes.

The search for the cause, therefore, if it be not found in some source of contact, must of necessity include a complete and thorough study of the patient from every angle—foci of infection, ingestion of drugs, errors in metabolism, offending foods and gastro-intestinal and other visceral disorders, come in for special consideration. Functional as well as organic disturbances must be attended to.

It is obvious from what has already been said about the multitudinous exciting or precipitating causes of eczema that scientific treatment must needs rest upon the elimination of the cause. Wherever that be possible there will be in most cases a spontaneous *restitutio ad integrum.* Symptomatic treatment is, however, essential in all cases, whether the etiology be determined or not, to secure relief of itching and burning and to hasten a return of the skin to normal. Even in the eczemas of undetermined origin, symptomatic treatment alone is sufficient to effect a cure in almost all cases, but the tendency to recurrence in these cases is relatively greater. Treatment shall be divided into general, local, and regional.

General Treatment

Rest, both mental and physical, is of prime importance. The efficacy of this measure can hardly be over-emphasized particularly if the eczema is one of fairly widespread distribution. Rest in bed furthermore permits and facilitates the frequent and proper application of remedies, in this way diminishing the duration of illness and treatment. Another consideration not without interest and importance, is the temporary removal from sources of contact which bed rest offers. (This procedure may be of considerable diagnostic help when the individual returns to his usual or previous sources of contact.)

The successful treatment of eczema is dependent upon the relief of its most distressing symptom, pruritus. Pain in comparison is pleasurable and it is this sensation which the patient substitutes in an orgy of scratching to relieve a crisis of itching. The cycle is a wicked one, for scratching aggravates the eczematous process and this in turn causes more pruritus. Listed below, together with the various anti-eczematous remedies, are some of the more useful anti-pruritic drugs. It is necessary to call attention to the fact that drugs, such as benzocain, which relieve pruritus by their effect on the terminal nerve endings, are rather frequent sensitizers. Their effects must be closely watched. We are in the habit of performing patch tests and determining the patient's reaction to these substances before permitting him to use the prescribed remedy.

If necessary—and if the pruritus is at all pronounced it is necessary—rest and relief of pruritus must be accomplished by the use of general sedatives. Bromides, barbiturates, salicylates, carbamides will have to be tried at one time or another. We need hardly add that opium and its derivatives are never to be used, no matter how severe the pruritus.

An aid to the treatment of severely pruritic eruptions is the use of the ordinary splint, properly adjusted and bandaged so as to prevent the bending of wrist and elbow. At times even the lower extremities will require splints. Inhumane as this treatment may seem, we should like to assure the reader that it is far from being so, and in addition is an extremely effective mode of therapy. Once the patient has learned the value of the splint he will actually insist on its application to prevent the nocturnal, and even diurnal, subconscious scratching.

In general we advise against the use of baths, even baths medicated with starch, bran, oatmeal, potassium permanganate or tar, in the acute and subacute processes. We have time and again seen an existing eruption well on its way toward healing, exacerbate after a single bath. On the other hand in the dry chronic, infiltrated, extensive cases medicated baths are of proven value and add much to the patient's comfort.

Except for the cases of alimentary idiosyncratic eczema in which some specific food or foods are at fault, diet plays a rather small part in treatment. There are indications of the usefulness of dietetic restrictions in some cases, to be sure, and the future probably holds much in store for those patients who exhibit some error of metabolism, but at the present time the question of diet in eczema is in a rather sad and chaotic state. Perutz, Gerson and others advise a low protein, high carbohydrate, moderately high fat, salt-free diet, with a great deal of fruit, fruit juices and vegetables. Obstinate cases deserve a trial with the salt-free diet.

Diuretics, the value of which is too often neglected and overlooked are of some benefit in the bloated, obese individual with loose, flabby, edematous skin. Of the saline diuretics, potassium nitrate in half gram doses is probably the most useful. The combined fasting and purge treatment of Guelpa is similarly effective. The patient is instructed to take an ounce or an ounce and a half of Glauber's salts in a pint of warm water, in the morning. During the day only liquids without any food value, water and fruit juices, are permitted. The following day, the regular diet is resumed. The frequency with which such drastic treatment may be repeated, depends on the general health of the individual.

Cabinet baths will at times offer startlingly favorable results. The modus operandi is not well understood, but it may be nothing more than a dehydration effect such as is produced by diuresis. They are especially recommended for the generalized, subacute and chronic, dry, infiltrated eczemas.

While the literature is replete with excellent results achieved by the intravenous administration of calcium, sodium thiosulphate, and 10 per cent strontium bromide in glucose solution, our own experience with these has been disappointing. Non-specific measures, such as the administration of the patient's own blood (autohemotherapy), turpentine and various forms of milk have sometimes proved effective. We have always considered the administration of typhoid vaccine as too drastic a method of treatment for most chronic eczemas, and the indifferent results achieved in the hands of others has served only to confirm our viewpoint.

Local Treatment

We have thus far purposely refrained from any lengthy discussions of the morphologic characteristics of the various stages of eczema. They are too well-known to bear repetition. In discussing the treatment, a consideration of the morphologic characteristics, however, becomes of greatest importance, for the treatment is directly dependent on the clinical appearance of the eruption. It is not a matter of indifference whether a salve, a lotion or a wet dressing be used in a given case. They each have their indications.

Below are listed in tabular form the most common remedies used in the treatment of eczema; as indicated, the remedies range from weak, used in the acute cases, to strong used in the chronic cases.

Acute

Zinc oxide—ointment (U. S. A.); shake lotion; zinc-oil mixture. (See below.)

Bismuth subnitrate 5-10% ointment.

Boric acid—ointment (U. S. P.)—3% aqueous solution.

Liquor Burowi (Liq. Alumini Acetatis) diluted 1-10; Burow's paste. (See below.)

Salicylic acid 2% solution—2-4% in shake lotion or paste.

Resorcin 2-4% solution.

Tannic acid 2-5% solution—3% shake lotion.

Nitrate of Silver ⅛-¼% solution.

Subacute

Ichthyol 5-10% in shake lotions and ointments.

Liquor carbonis detergens 5-10% in shake lotions and ointments.

Naftalan 5-20% in ointments.

Crude coal tar ½-4% in ointments.

Ammoniated mercury 2-10% in ointments.

Chronic

Ol. cadini 5-15% ointment.

Ol. Rusci 5-15% ointment.

Crude coal tar 5-20% ointment. May be painted on full strength.

Resorcin 4-10% ointment.

Salicylic acid 4-10% ointment.

Sulphur 4-10% ointment.

Ammoniated mercury 4-10% ointment.

Chrysarobin ½-10% ointment.

Anti-Pruritics

Menthol	¼-1%
Phenol	1-2%
Benzocain	3-10%
Liquor carbonis detergens	3-15%
Ichthyol	3-10%
Salicylic acid	1-2%
Sulphur	2-4%
Chrysarobin	1/10-1%

We have purposely limited the number of remedies given in the above table. Here as in other branches of medicine, the intelligent and judicious use of a few well-chosen remedies is wholly preferable to the haphazard use of many. To enhance the effect of a lotion or salve, combination of two or more of the active ingredients is often preferable to an increase in the concentration of the one active component.

Primum non nocere is the first law of dermatologic therapeutics. It is especially applicable to the treatment of the patient with eczematous dermatitis for here we are dealing with a susceptible individual, and the possibility of sensitization to some eczematogenous substance such as mercury, sulphur, or tar is relatively greater. The earlier studies of Bruno Bloch aptly demonstrated that the sensitivity in the eczematous subject was polyvalent and that reactions to numerous eczematogenous substances by patch test were elicited. Treatment must of necessity, therefore, be conservative and not over-zealous or aggressive. It is most advisable to start with the weaker remedies given at the head of the list and gradually proceed to the stronger remedies listed below. The effects of each change must be carefully observed and the first signs of intolerance call for a return to a milder remedy.

If the choice of a remedy is important, the method of application is not less so. It does not suffice to prescribe a salve or a lotion and instruct the patient to "go home and use it." Remedies must be properly applied. The basis for success in the hands of one physician, and failure in another, often depends upon this one factor alone. The patient should be instructed minutely in every detail; advised to massage (if indicated) the salve into the affected area for several minutes by the clock, to apply a liberal layer, to cleanse the area with olive oil before each application, and whereever possible to bandage the affected part. Wet dressings must be kept wet, lest they serve as a source of irritation upon becoming dry. Lotions are to be applied often and liberally, so that they thoroughly cover the affected area. Once daily, the caked and crusted lotion should be removed by sopping the part with a three per cent aqueous solution of boric acid or with olive oil.

In the acute erythematous and vesicular stage wet dressings are the treatment of choice. They are cooling, soothing, anti-pruritic, allow for drainage of serum, relieve swelling, and give the patient more comfort than any other single remedy. Boric acid three per cent, liquor alumini acetatis (N. F.) diluted 1:10, resorcinol 2-4 per cent, tannic acid 2-5 per cent, salicylic acid two per cent, are all effective and satisfactory. In impetiginized eczema resorcin 2-4 per cent, or 1:2000 solution bichloride of mercury should be used for their bactericidal powers. Silver nitrate, in ⅛-¼ per cent dilution, does not enjoy sufficient popularity as a wet dressing. Were it not for the staining qualities which preclude its use on exposed portions of the body, silver nitrate would be the wet dressing of choice; it is to be highly recommended. Wet dressings should be bandaged wherever practicable and should be kept wet continuously until the dry, scaly stage is reached. Cellophane acts as an excellent protective covering for a wet dressing and keeps the bandages moist.

While lotions and pastes are not as effective as wet dressings during the acute stage, they are nevertheless eminently satisfactory and in addition offer the patient a simpler and, therefore, quite often, a more desirable form of treatment. They are prescribed when, for one reason or another, a wet dressing is not deemed advisable.

The following are recommended:

(1)	Liquor Burowi	15.
	Zinc oxide	
	Talc aa	30.0
	Glycerine	24.0
	Aqua calcis ad	120.0
(2)	*Calamine Lotion*	
	Calamine	12.0
	Zinc oxide	15.0
	Glycerine	12.0
	Aqua calcis	15.0
	Aqua rosae ad	120.0
(3)	Bismuth subnitrate	30.0
	Zinc oxide	60.0
	Olive oil	
	Liquor calcis aa ad	240.0
(4)	Zinc oxide	
	Talc	
	Glycerine	
	Aqua calcis v.s.	
(5)	Zinc oxide	25.0
	Talc	25.0
	Ol. Olivae	50.0
(6)	*Burow's Paste*	
	Liquor Burowi	10.0
	Lanolin anhydrous	20.0
	Lassar's paste	30.0

In the dry desquamative stage, treatment with a bland ointment such as boric acid (U. S. P.), zinc oxide ointment (U. S. P.), or Lassar's paste, until there is a return of the skin to normal, is indicated. Burow's paste (see above), cooling, soothing, and softening may be helpful in the acute or in the dry desquamative stage.

The subacute stage with its dry, crusted, scaly areas, is best treated with lotions or salves. We are rather partial to lotions, particularly in the widespread cases. They offer a cleaner and more satisfactory form of treatment to the patient, are more easily applied and do not require bandaging. In subacute eczema the pathologic process is superficial enough to be influenced by the active ingredients in the lotions. The following are recommended: Liquor carbonis detergens 5-10 per cent, ichthyol 5-10 per cent, resorcin four per cent, salicylic acid 2-5 per cent, tannic acid three per cent, to be added singly or in combination to the calamine lotion, as given above. The liquor Burowi lotion may be used as a base instead of the calamine lotion for all of the active ingredients except tannic acid if a change is required. Tannic acid in that combination is incompatible and causes the mixture to cake. Benzocain, five per cent and menthol ⅛-¼ per cent, should be added whenever necessary to control the pruritus.

The various active ingredients listed in the subacute group may be used in ointment form as follows:

Benzocain	5.0
Naftalan	3.0-10.0
Acid salicylic	2.0
Zinc oxide	
Amyl. aa	25.0
Vaseline flav. ad	100.0

Menthol	0.15
Liquor carbonis detergens	3.0-6.0
Liquor Burowi	10.0
Lanolin anhydrous	20.0
Lassar's paste ad	60.0

Superficial, unfiltered, X-ray therapy in fractional dosage is a useful adjuvant in the treatment of subacute eczema.

It is the dry, chronic, thickened, lichenified, scratched eczema which offers the most difficult problem and taxes the skill of the physician.

The remedies employed are all reducing agents, and of these tar is king. It is the most important and reliable single therapeutic agent used in the treatment of chronic eczema. Jadassohn has suggested that tar produces its effect by causing a non-specific desensitization of the skin. Lichenification and thickening require depth of action and for that purpose ointments are most suitable. The addition of salicylic acid 3-10 per cent and resorcin four per cent to 10 per cent promotes the effects of tar by their keratolytic action.

In those cases which do not yield to tar, chrysarobin (should be fresh) is strongly recommended. The patient should be warned against the transference of chrysarobin to the eyes: severe conjunctivitis will result.

Crude coal tar	4%-10%
Salicylic acid	4%-10%
Lanolin	
Petrolatum v.s.	

Drew's ointment (modified)

Salicylic acid	2.0-10.0
Chrysarobin	2.0-10.0
Ol. Rusci	5.0-10.0
Soft soap	25.0
Lanolin anhydrous	25.0

Fractional doses of X-ray are most helpful in the treatment of the chronic, lichenified, thickened eczemas, especially the localized variety. Frequently X-ray is the only satisfactory form of treatment, and patches which have resisted topical remedies of all kinds, will yield to four or five weekly exposures. In the recurrent cases, overdosage must be guarded against, and X-ray must be stopped when the limit of tolerance is reached.

Certain regional eczemas require special consideration. In the acute vesicular dermatitis of the extremities accompanied by swelling and tension, elevation of the extremity, upper or lower, will hasten a return to normal, by improving circulatory dynamics. The course is otherwise often a protracted one.

In the subacute and chronic eczemas of the extremities, especially the lower, the application of Unna's zinc gelatin boot will bring relief to the patient and will promote quicker healing than any other measures we can recommend. The technique we employ is as follows: The extremity is encased in a stockinette bandage, and the warmed, liquid zinc-gelatin mixture is applied directly to the stockinette and is than firmly bandaged with the ordinary gauze bandage. We find this method superior to the application of zinc-gelatin directly to the skin followed by the application of cotton wadding, or the tedious application of zinc-gelatin directly to the bandage in its endless circuitous course.

There are various modifications of Unna's original zinc-gelatin formula, all satisfactory. Proprietary preparations are also available. Pusey, in the August, 1935, issue of the Archives of Dermatology, gives the following formula:

	Parts
Mixed zinc oxide and calamine	15
Gelatin	28
Glycerine	28
Water	29

The bandage may be preceded by the application of tar ointment or gentian violet, two per cent, in 50 per cent alcohol. The latter is useful in the nummular, vesicular, crusting patches so often found on the extremities.

Eczema of the axillary and pubic region is best treated with lotions or with alcoholic-aqueous solutions. Salves in these areas lead to an annoying folliculitis.

The eyelids are best treated with wet dressings of boric acid solution or diluted Burow's solution. In the cases with dry, scaly, fissured canthi we suggest boric ointment or the commonly used one per cent yellow oxide of mercury ointment. X-ray in small fractional doses is helpful.

The subject of infantile eczema forms too large a chapter for lengthy discussion in this communication. We shall only indicate the more important measures. In the first place the infant is to be kept at rest, with the extremities tied or splinted to prevent scratching and irritation.

Errors in diet, such as overfeeding in the obese child, and insufficient feeding in the poorly nourished, must be corrected. Idiosyncrasy to milk or some other article of food in the infant's diet is often at fault. Elimination of the food product in question, boiling the milk, addition of hydrochloric acid, substitution of a soy-bean preparation for milk, are all helpful measures which can be tried. If possible, the diet in these cases should be arranged by consultation with a pediatrician.

Locally White's crude coal tar ointment which consists of two parts of zinc oxide and crude coal tar, and sixteen parts each of starch and paraffin, offers the best results in eczema. The tar and zinc oxide are each separately mixed as are the starch and paraffin, and then these two combinations are thoroughly mixed. If a distilled crude coal tar product is used the folliculitis which commonly follows the ordinary crude coal tar will be prevented. The salve should be thoroughly applied and then covered with a mask. Not all cases require such diligent treatment. The remedy should be tempered to the clinical condition, and a mild infantile eczema will often yield to treatment with 10 per cent naftalan in zinc oxide ointment.

We do not subscribe to the view that a great percentage of cases of infantile eczema are in reality contact dermatitides. Aside from other considerations, the fact that a great number of neurodermitis cases give a history of infantile eczema, and that conversely a great number of cases of infantile eczema whom we have observed have developed neurodermite or some other atopic disease, leads us to believe that by far the greatest percentage are to be explained on an atopic basis. Some others are due to errors in diet, still others are founded on a seborrhoeic basis, and some may be due to contact.

In conclusion, it might be well to repeat that the treatment of eczema, in its various and diversified forms and aspects, requires meticulous attention to detail on the part of the physician, and the whole-hearted co-operation on the part of the patient.

A Study of 2,113 Cases Given Contraception at the Minnesota Birth Control League Clinic

Milton Abramson, M.D., Ph.D.
Minneapolis

THE present report is a scientific study which, I hope, will be of interest to all of those who are interested in contraception, and particularly to those physicians who would like to know of the results that have been obtained by a local branch of the Minnesota Birth Control League, and of the reasons for failures where they have been obtained.

This report is based on 2,113 cases given contraceptive advice at the Minnesota Birth Control clinic from its inception in 1931 to October, 1935. The case histories are divided into two groups. The first group is composed of 712 cases that have been discharged from the clinic for some reason or other. The second group composed of 1,401 cases still remains in the active files of the clinic, that is, this group of cases is supposedly still returning to the clinic either for supplies or instruction.

I shall first present to you the more obvious facts as recorded on the case histories. Of the entire series of 2,113 patients the age limits were as follows:

Under 20 Years	71
20-24	466
25-29	617
30-34	498
35-39	318
40-44	125
45-49	15

Patients were divided according to religion as follows:

Protestant, Lutheran	1483
Catholic	478
Jewish	47
Others	102

About 22 per cent of patients are Catholic.

The majority of husbands of these patients were in the laboring class:

Laborers	1045
Skilled Trade	727
White Collar	255
Professional	77

As far as the education of the patients is concerned they are divided as follows:

No Schooling	18
1-4 Grades	44
5-8 Grades	930
1-2 Years High School	448
3-4 Years High School	525
Beyond High School	151

An interesting compilation was that in regard to the sources of supply of clinic patients:

CHS (Community Health Service)	772
FWA (Family Welfare Ass'n)	223
Publicity	198
Dr.	101
Patients	463
Members	80
Other Social Agencies	275

Approximately 35 per cent of the patients were referred to the clinic by the CHS.

Age at First Pregnancy

14...... 6	21......255	28......46	35......4
15...... 8	22......169	29......37	36......1
16...... 60	23......156	30......26	37......2
17......124	24......132	31......10	40......2
18......240	25......112	32......10	
19......285	26...... 72	33...... 9	
20......288	27...... 39	34...... 3	

Sixteen patients had never been pregnant.

In the entire group of 2,113 patients there were a total of 8,875 pregnancies or an average of 4.2 pregnancies per patient. And in the same group there were a total of 6,963 living children or an average of 3.2 living children per patient.

The whole group had had a total of 119 still births and a total of 1,436 abortions. Of the abortions 490 were induced by the patient herself or by an abortionist, certainly a very small percentage.

One thousand one hundred fifty-eight patients had one child under one year of age at the time of their admission to the clinic and 13 patients had two children under one year of age at the time of their admission to the clinic. The majority of the latter were the result of twin pregnancies.

Of the patients cared for, 1,820 had used some form of contraception before coming to the clinic; 174 patients stated that they had never used any contraceptive method previously. There was no data recorded in 119 cases.

The commonest methods of contraceptive used by patients before coming to the clinic were in the order of their frequency, withdrawal, douche, and condom, and the other methods recorded included suppository, pessary, jelly, vaseline, sponge and others.

Frequency of coitus as reported by patients varied from daily to less than once monthly, the commonest frequency being reported as one to two times weekly.

One hundred and seventy-seven patients out of the total of 2,113 reported the presence of dyspareunia in some degree.

Eight hundred and eighty-seven patients reported that they never, seldom, or only occasionally had orgasm. Seven hundred and nineteen patients reported that they usually or always had orgasm. In the remaining number of patients there was no data.

The routine explanation for lack of orgasm as noted on the charts was "the fear of pregnancy." This explanation was recorded many times as "probably due to fear of pregnancy," or "undoubtedly fear of pregnancy." It is my opinion from a study of the charts that these conclusions as recorded were the opinion of the recorder rather than that of the patient. I feel that the fear of pregnancy has nothing to do with whether or not a patient has orgasm, and these statements as recorded are unscientific and of no value as the basis of any study. In support of this opinion I would like to cite the work of G. V. Hamilton who made a research on marriage extending over a period of four years, and comprising over eighty thousand separate responses to questions asked regarding the marital relationship. He states that "the fear of pregnancy seems to have no more effect on the ability to reach the climax than the presence of the climax has to do with the ability to be pregnant. If the fear were violent it might, like many another negative state of mind, inhibit her nervous reaction to her mate. But the statements show that the fear of pregnancy is not so very violent or even at all general at any crucial time. It is only after pregnancy that a woman begins so actively to fear it. She is apt to escape this fear during the first year of marriage when the habit of climax, or the lack of it, is most likely to be established."

The doctor's reason for giving contraception in all cases was to maintain the health of the patient, and no case was refused contraception for any reason as far as I could determine from the charts. Of the total number of patients treated only 11 were given a method other than the diaphragm. Of these ten were given condoms and one was given the jelly and applicator alone.

The prognosis as to the probable outcome of the method given was poor in sixty-five cases and questionable in forty-eight cases; in the remainder the prognosis was either good or fair.

There were noted a total of 910 retroversions of the uterus, an incidence of 43 per cent.

The size of pessaries given patients is one of the most important of the facts determined from this study; they were as follows:

		Patients
Size 70		11
75		79
80		297
85		501
90	524	1161
92½	6	
95	369	
97½	7	
100	226	
102½	13	
105	16	

In other words over 50 per cent of the patients were fitted with a size 90 or larger.

In the Lancet there appeared in 1930 some correspondence on the size of contraceptive pessaries used, and there were important differences of opinions expressed by several authorities. Norman Himes in the J. of the New Hampshire Medical Society, May 1, 1930, compared the contraceptive methods advised at British clinics. He drew attention to the fact that the sizes of pessaries most favored at nine of the English clinics varied by as much as 10 mm., the smallest of these most favored sizes being 67.5 mm. and the largest being 77.5 mm.

Dr. Norman Haire, an authority on contraception, has written that while in the early years of his practice he had advised large sizes of pessaries, he found later that certain disadvantages attached to these larger sizes and that he now advised smaller sizes (55-70) (rarely over 70). One of the most useful conclusions that came to light at the Seventh International Birth Control Conference held in Zunich bore upon the question of sizes of pessaries. The result of a questionnaire issued to clinics before the conference showed that at 26 American clinics that had taken care of 36,804 women the average sizes of pessaries fitted were 70, 75, and 80. At 16 British clinics that had fitted 45,321 women the average sizes were 70, 72.5, and 75.

It is my opinion that the sizes fitted at the clinic are too large. Many of the case records show that the patient complains of pain on insertion, many do not leave the pessary in for eight hours because of pain, many state that the pessary feels too big, and a contraceptive pessary once in place and fitting properly should not be felt at all by the patient; and many of the patients state that their husbands object because they feel the diaphragm. As a result of this study patients are now being fitted with smaller size diaphragms and it is felt that this alone will be one of the biggest factors in reducing the number of unwanted pregnancies. Patients will now use the diaphragm because they will have no discomfort.

Of the total of 2,113 case records examined 712 cases have been definitely discharged from the clinic for the following reasons:

Moved Out of City	55
Moved—Lost Track of	67
Patient Wouldn't Co-operate	388
Too Much Bother	6
Low Mentality	2
Transferred to Dr.	4
Method Not Suitable	4
No Need, Death, Separation, Etc.	82
Patient or Husband Doesn't Like Method	69
Religion	17
Prefers Own Method	8
Domestic Trouble	3

Subtracting these 712 cases from 2,113 leaves 1,401 cases that are still active.

Now as to the number of clinic visits made by these discharged patients after their initial visit and before discharge:

No Visits	139
1 Visit	226
2 Visits	161
3 Visits	118
4 Visits	48
5 Visits	12
6 Visits	2
	696

In this group of 712 cases there were 50 unplanned pregnancies, and one planned pregnancy. The reason for these pregnancies were given as follows:

Patient Didn't Use	20
Patient Removed Too Soon	4
Pain	8
Ran Out of Jelly	4
Method Wrong for Patient	3
Lost Pessary	1
Unknown	5
Hole in Pessary	4
Always Used	1

It is interesting to note that only one out of these 50 cases stated that she always used the method.

The remaining 1,401 cases are still in the active files of the clinic and are all supposed to be returning to the clinic for supplies, or for instructions before being transferred to supplies. Of these 1,401 cases, according to the records, 974 have been transferred to supplies.

These supply patients made the following number of visits to the clinic before being transferred to supplies:

1 Visit	18
2 Visits	267
3 Visits	395
4 Visits	217
5 Visits	68
6 Visits	8
7 Visits	1

So that patients before being transferred to supplies made an average of three visits each to the clinic for instructions.

Of the cases in the active files of the records there were a total of 127 unplanned pregnancies and 11 planned pregnancies, and a group of 19 cases that have been placed under the heading of pregnant when fitted.

The reasons for the unplanned pregnancies were recorded as follows:

Patient Didn't Use (No Reason Given)	40
Patient Didn't Check	3
Patient Removed Too Soon	2
Didn't Use Correctly	4
Unknown	53
Pessary Fell Out	1
Ran Out of Jelly	17
Hole in Diaphragm	6
Patient States Always Used Correctly	1

There were then a total of 177 pregnancies resulting in the 2,113 cases who were fitted with diaphragm, or a pregnancy incidence of about 8.3 per cent.

I do not feel that this is a condemnation of the method because on examining the figures we find that a large number of patients who became pregnant did not use the diaphragm or if they did use it, they used it incorrectly according to their own admission. The important fact determined is that the patients did not use the method after being given it, and my contention is that the method was not used because of discomfort incident to the large size diaphragms used.

Another opinion based on this study is that a certain percentage of patients who are fitted with the diaphragm should not really be given this method at all. Hannah Stone writing in the Journal of Contraception on "Present Day Problems in Contraception" makes the following statement: "For a certain percentage of women, however, the vaginal diaphragm is unsuitable. In the presence of a lacerated perineum, a marked cystocele, rectocele or prolapsed uterus, a diaphragm cannot be well fitted. It tends to sag down and may not offer adequate protection. For such cases a suitable substitute method has to be found. At our clinic we have been prescribing other mechanical devices for these women."

From a study of the 2,113 charts of the Minnesota Birth Control clinic it is my opinion that patients of the clinic are receiving adequate and sympathetic instruction and care; that the clinic is attempting to co-operate with the private practitioner; that the eight per cent of failures is not because of the inadequacy of the method itself but rather because of the inadequacy of the patient; and that the clinic deserves the support of all members of the community, lay and professional alike.

BOOK NOTICE

UNIVERSITY OF MICHIGAN FORMULARY

Formulary of the University Hospital, University of Michigan, by HARVEY A. K. WHITNEY; loose-leaf, planograph printing, no illustrations, cloth boards with screw binders; Ann Arbor, Michigan: Edwards Brothers, Inc.: 1934. Price, $2.50.

This little loose-leaf volume is an aid to physicians who wish to prescribe therapeutically active and clinically proven drugs. It is designed by Mr. Whitney, who is chief pharmacist to the University of Michigan Hospital, for use in conjunction with *New and Non-Official Remedies* and *Epitome of the Pharmacopoeia of the United States and the National Formulary,* both published by the American Medical Association. All measurements are therefore given in the decimal (metric) system, to conform to the above volumes.

The volume has been typewritten, then planographed. It is fashioned so that additional material may be added from time to time. Beyond a doubt, this manual will be very valuable to many practitioners, many of whom have been searching for such a guide. This one is authoritative.

QUACKERY EXPOSÉ

Diet and Die, by CARL MALMBERG; first edition, light cream cloth, stamped in blue, 143 pages plus index, no illustrations; New York: Hillman, Curl, Inc.: 1935. Price, $1.50.

It is well-known that prolonged emaciation and malnutrition dispose favorably toward tuberculosis; it is well-known generally that dinitrophenol is a fearsome drug; it is well-known to physicians generally that rough bran taken constantly may produce chronic irritation in the digestive tract. Yet the public continues to be bilked, and seemingly enjoys the process. The author of this small volume effectively strips away the sham and quackery enclosing our modern proprietary medicine charlatans. He shows that the reducing craze is largely piloted by mountebanks. And he concludes by offering a safe, moderate, and sensible dietary system for would-be reducers. This is a good book.

SYNOPSIS OF HEART DISEASES

Synopsis of Diseases of the Heart and Arteries, by GEORGE R. HERRMANN, M.D., Ph.D.; first edition, red cloth, stamped in black, 328 pages plus index, [illegible] text illustrations and 3 color plates; Saint Louis, Missouri: The C. V. Mosby Company: 1936. Price, $4.00.

Professor Herrmann, who is professor of clinical medicine in the University of Texas School of Medicine, has produced a work which is exactly what the title implies—a synopsis. It is not intended for the specialist, and should not be regarded in that light. But it is an invaluable little guide for the student and the busy general practitioner.

An important point motivating in favor of his handbook is the fact that Professor Herrmann has followed the precepts of the American Heart Association in establishing that organization's trinity of diagnosis: the *etiologic* factor, the *anatomic* lesion, and the *physiologic* and *functional* derangements. These precepts are necessary to the highest standards of cardiovascular practice, and it is satisfying to see that the author has adhered to them so faithfully. This book is recommended by The Journal-Lancet.

THIRD EDITION OF CHRISTOPHER'S "MINOR SURGERY"

Minor Surgery, by FREDERICK CHRISTOPHER, S.B., M.D., with a foreword by ALLEN B. KANAVEL, M.D.; third edition, heavy green cloth, gold-stamped, 1,030 pages and 709 illustrations; Philadelphia: The W. B. Saunders Company: 1936. Price, $10.00.

"It is by the study of minor surgery that the surgeon begins his apprenticeship," wrote Maisonnet, who is quoted on the fly-leaf of this volume.

That is probably quite true; yet as Professor Kanavel observes in the foreword, it is difficult to draw a definite line of demarcation between *major* and *minor* surgery. With this observation in mind, it seems to the reviewer that Professor Christopher has produced as competently-inclusive a volume as any surgeon would desire. There are considerations in this work which at first appear to belong to major surgery. But when one considers the plight of minor surgical procedures if these considerations were omitted, it is seen that Dr. Christopher has been quite conservative in his selection.

Practically every minor surgical problem the practitioner will ever encounter is included in this work. For that reason, it is of particular value to the surgical intern, and the young surgeon. It is a volume fitted to be placed next to Dr. Christopher's beautiful new *Textbook of Surgery,* likewise published only this year by Saunders.

UNDERHILL'S "TOXICOLOGY"

Toxicology, by FRANK P. UNDERHILL, Ph.D.; revised by THEODORE KOPPANYI, Ph.D.; third edition, light green washable cloth, gold-stamped, 325 pages, no illustrations; Philadelphia: P. Blakiston's Son & Company: 1936. Price, $2.50.

Professor UNDERHILL died in 1932; hence the current revision of this standard toxicology text by THEODORE KOPPANYI, Ph.D., professor of pharmacology and materia medica in the Georgetown University School of Medicine at Washington, D. C.

A number of new toxicological products are included in this work, such as avertin, the camphor substitutes, cinchophen, cyclopropane, dinitrophenol, ephedrine, mercurial diuretics, the newer barbituric acid derivatives, quinine and its substitutes, triorthocresyl phosphate, and thyroid. Chapters on carbon tetrachloride, thymol, thallium, and food poisoning have been rewritten. The chemical formulae of poisons are not given, except where it is deemed necessary to avoid confusion with other agents.

This is a sound little text, brought thoroughly up-to-date by Professor KOPPANYI, who deserves more credit for it than he expects.

TEXT ON SOCIAL SECURITY

Social Security in the United States, by PAUL H. DOUGLAS, A.B., Ph.D.; first edition, 323 pages plus bibliography, appendix, and index, black cloth, gold-stamped, no illustrations; New York City: Whittlesey House: 1936. Price, $3.00.

There can be no doubt that DOUGLAS, who is professor of economics in the University of Chicago, is an authoritative figure in the field of social economics. The ironic part of it is that economists, fully as much as sociologists, can be romantic as any provincial rustic. The fact that he is a chancellor whose ward is statistical interpretation confers no emblem of infallibility upon any economist.

This work has been inscribed to Senator ROBERT F. WAGNER, ABRAHAM EPSTEIN, and I. M. RUBINOW, who are felicitously labelled: "Pioneers in the Movement for Genuine Social Insurance." Needless to say, the sympathies of these three gentlemen do not extend to present-day organized medicine.

Professor DOUGLAS does not like the Federal Social Security Act as it was passed. Few do. His essential criticism is that it does not go far enough. Considering the medical aspects of the Act, he shows that it embraces (1) assistance to dependent children, (2) maternal and child health, (3) care of crippled children, (4) care of neglected children in primarily rural areas, (5) vocational rehabilitation, (6) pensions for the blind, and (7) public health.

Professor DOUGLAS has included the complete text of the Social Security Act in this volume. From the viewpoint of the physician, the book is valuable in evaluating the extent and fervor of the forces now agitating for more drastic measures in the control of organized medicine in the U. S. by sociologists and professional idealists.

MAYO MEMENTO

The Mayo Clinic, by LUCY WILDER (Mrs. RUSSELL M. WILDER); first edition, heavy cloth, printed in maroon, 82 pages with line illustrations by RUTH BARNEY; Rochester, Minnesota: The Bookshop of Lucy Wilder: 1936. Price, $1.25, postpaid.

This volume is essentially an example of good production and excellent format. It is what the patient would like to take with him when he leaves the Mayo Clinic. It presents an historical background of the Clinic, going back as far as WILLIAM WORRALL MAYO, M.D., the young English chemist who came to the U. S. in 1845, gaining his doctorate in medicine in 1854 at the University of Missouri in Saint Louis. Description of procedure and technics employed by the Clinic is necessarily cursory. The drawings by RUTH BARNEY of Minneapolis do not rise above the commonplace. Physically, however, the book is beautifully printed, and a good stock has been used. But it is not easy to see why the names of GEORGE B. EUSTERMAN *(p. 46)* and VIRGIL S. COUNSELLER *(p.19)* should have been mispelled.

This is a fine-looking volume, well-printed and agreeably decorated, which should appeal to the average patient.

NEW ENDOCRINOLOGY TEXT

Endocrinology in Modern Practice, by WILLIAM WOLF, M.D., M.S., Ph.D.; first edition, dark green cloth, gold-stamped, 1,018 pages and 252 pages; Philadelphia: The W. B. Saunders Company: 1936. Price, $10.00.

Nearly every ordinary disease exhibits a more-or-less definite endocrine component. That is precisely why the undergraduate medical student and the general practitioner may extract much practical assistance out of a text on endocrinology, in spite of the fact that at first glance, the field itself seems very narrow and highly-specialized.

Published in June, 1936, this work should be valuable to any physician interested in the subject. The author presents a consideration of the endocrines, with the physiology, anatomy, chemistry, pathology, *etc.*, of each gland; and then includes the endocrine aspects of non-endocrine diseases, endocrine diagnosis, and a thorough section on endocrine preparations.

While it may perhaps be said that the illustrations in this work are not so clear as those customarily accompanying most Saunders books, the admirable text allays this deficiency. It is felt that THE JOURNAL-LANCET may recommend this volume by Dr. WOLF.

The JOURNAL LANCET

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MEDICINE AND POLITICS

We are about to witness mass political activity *(blocs)* in action. Partisanship, humid and vindictive, will venture to align further group against group and we know not what sort of political alchemy will result. We need only look at the daily reports from France to see to what ends groups which happen to be in the ascendancy exercise their position to gain an apparent increase of income at the expense of all others.

Our profession should keep in mind the futility, not to mention the disaster, inherent in any such movement. A recent writer has well put it: "You cannot delegate your responsibilities either to governments or to gigantic corporations, for conscience, whether for personal or business decisions between right and wrong, is inherent in the individual and not in the mass. Men in mobs are ever guilty of actions which they unconditionally condemn as individuals."

There is much talk among us to induce us as doctors to trek unitedly, and build up thereby political prestige and voting strength. Let us be cautious that in so doing we do not openly invite upon ourselves that regimentation we seek so avidly to avoid; lest in submerging our individuality of opinion as a neighbor and citizen we establish just another *bloc.*

E. L. T.

AMBULANCE HUBBUB

At a busy intersection a few days ago, pedestrians might have looked up and accidentally discovered an emergency ambulance crossing the avenue in the course of regular traffic. We say accidentally because there was no wild commotion, no clanking of gongs and no screeching of a fire engine siren to add to the confusion that usually accompanies this terrifying messenger to attract the attention of the passer-by.

The first reaction was one of surprise, an event so unusual should have appeared in the news section, but the surprise was such a pleasant one that we would pause to comment and commend. The second reaction was that of curiosity. Did the ambulance conceal an empty cot or is it possible that the vehicle was actually driven to serve the comfort and convenience of some sick person within? As a rule, such persons should be moved slowly, cautiously and quietly to insure safety and rob the patient of the anxiety incidental to the journey, but the exception to the rule has been most notable in the past.

It is not always the ambulance driver's duty to imitate the heroic understudy in a dangerous movie role, but his knowledge of this has not been evidenced by past performances, and yet here was proof of a pleasant change.

A. E. H.

A QUESTION OF ETHICS

Regular members of the medical profession have always sensed a feeling of shame and humiliation when seeing patients going to quacks and charlatans for treatment.

We may, as individuals, have certain weaknesses and failings, but of one point we are sure: the profession-at-large has everything that is valuable, up-to-date, and efficacious, and always has had.

The quack, of course, has little to offer except his sales talk. Yet it is this sales talk, often relayed by other patients, which gives some people what we may term a "quack obsession." They are thereupon convinced that their regular physician knows less of the curative arts than the quack, and that he is dishonest. Some of them come to believe that any quack is better than a physician.

Take away a physician's reputation, and you take away his opportunity to make an honest living. Criticism in the medical ranks is dangerous. A chance remark, a jovial fillip, a light jest, often may rebound into an ugly slander, which damages a physician's reputation and removes his chance to practice in his community or elsewhere. Doctors must be careful. No remark that might be mistaken should ever be uttered. No act that might cause the public to criticize the medical profession should ever be committed. We know today that every act committed by an individual physician is charged up against the profession as a whole.

Quacks are quick to espy the weak points in medical care and treatment. They have therefore seized upon the question of low-cost medical care in time of depression, offering their wholly useless and often harmful services at much-reduced fees. They clinch their arguments by pointing to the noticeable fees levied by surgeons and other specialists, and by saying that they obviate all associated expense by a single charge.

It is our duty to uphold the integrity of our profession. If a fee seems large to the public or patient, it is incumbent that we uphold that charge, and explain its necessity. Yet sometimes a charge is made which we may by no stretch of the imagination justify. Our only course is to remain silent.

Yet, in such cases, has any member of our ranks the right to jeopardize all organized medicine by such action? Has any physician the right to bring down censure on all his fellows by such procedure? Is such a physician an ethical practitioner? J. L. S.

THE PRACTICE OF PREVENTIVE MEDICINE

Preventive medicine means to hinder the spread of communicable diseases by teaching personal and public hygiene and using venereal prophylaxis, immunity, and imparting knowledge of heredity and eugenics. It pertains to man and his requirements of air, water, light, soil, foods, clothing and shelter and the disposal of wastes, and the effects of unfriendly and friendly germs thereon. All of which demands instruction of the individual by one informed in hygiene. Who is better qualified than the family doctor?

State and local boards of health deal in preventive medicine for the effect on communities. Public hygiene as distinguished from personal; as it were, wholesale, not retail. The actual practice of preventive medicine is the business of the individual members of the profession. No one in my opinion is trying to take it away from him. But public demand for such practice must be met by more activity than the average practitioner is exercising, or other methods of supplying it will be devised.

For instance, take the smallpox figures of 1935 in the U. S.: 63 cases per million compared to 37 cases per million in Canada. In our own state, an average of 800 cases appears annually. Of course, all the blame for the spread of smallpox cannot be placed upon the profession, as the lack of interest of the people and the antagonism of the cultists keep many from vaccination. However, let us begin seriously to sell vaccination, and stamp out that loathsome disease.

Some of the younger members of the profession have realized that there is a big field for them in preventive medicine, and their plan is revealed to you with the hope that everyone will use it.

When called to minister to a patient, after furnishing the needed assistance, an attempt is made to take inventory of the family medical requirements, particularly about those who have not been immunized against smallpox, typhoid and diphtheria; and about those who have defects. He endeavors to answer the medical questions which bother the members of the family, and to bring ease of mind and confidence to the unfortunate one; or he explains the methods of immunization, doing away with dread of the process, and at the same time establishing a common bond between the family and himself through the discussion. In other words, this doctor is making an effort graciously, not blatantly, to become their family doctor, and is teaching family and personal hygiene.

If each of us will try to reinstate ourself as a family physician for those families in which we practice, and take an interest in the medical needs of our people, we will really serve humanity and make the world a better place in which to live, create a new confidence in the profession, and destroy the present influence of the cultists.

E. G. B.

C. GILBERT LUNDQUIST, M.D.

Leola, South Dakota

Physicians of South Dakota and the Northwest were bitterly grieved to learn of the death of C. Gilbert Lundquist, of Leola, South Dakota, who died at Saint Luke's Hospital in Aberdeen at 7:50 a. m. on June 26, 1936, as the result of an automobile accident on June 20, suffered in the course of his practice.

Dr. Lundquist was born on October 14, 1883, in Pembrook Township, Edmunds County, in what was then Dakota Territory. He was the second white child born in the Territory.

He completed his common school education in the public schools of Pembrook Township, and was for two years a student at the Madison Normal School, transferring from that institution to the Aberdeen Normal School, from which he was graduated in 1905. He was superintendent of schools for Java and Lesterville in South Dakota, and for Evanston in Wyoming. In 1912, his keen interest in medicine spurring him forward, he entered the University of South Dakota as a pre-medical student; but he was graduated as a physician from the Rush Medical College in Chicago, in 1918. He served his internship at the Cook County Hospital in Chicago, and in the San Diego County Hospital, San Diego, California.

For a while, Dr. Lundquist was located in practice in Rapid City; but in 1920 he bought the practice of Dr. G. G. Kerns, of Leola, South Dakota. He was a faithful and loyal member of the Aberdeen District Medical Society, which he served as president for a term; and he was a member of the South Dakota State Medical Association, and a member of the board of editors of The Journal-Lancet, the official medical journal for the medical associations of Montana, North Dakota, South Dakota, and several medical groups in Minnesota. He was a fellow of the American Medical Association, and a member of the American Heart Association. For several years he was president of the board of education of Leola.

Dr. Lundquist was married on June 30, 1926, to Miss Idelette Reue, a graduate nurse. Mrs. Lundquist assisted Dr. Lundquist as a nurse, and at the time of the fatal accident, was attending a patient while Dr. Lundquist was on his way to care for a woman in confinement.

He will be remembered for many years as a citizen who took unceasing interest in, and devoted much labor to, the civic and educational affairs of his town and state, in spite of the incessant cares and exacting duties required of him by his profession. No event or happening in his community was too unimportant for him to notice, and in many cases, to render of it his mellowed advice or counsel. In the South Dakota State Medical Association he was particularly esteemed for his industry and his fine appreciation of the virtues of co-operation.

Dr. Lundquist is survived by his widow, Mrs. Lundquist; his mother, Mrs. Mathilda Lundquist, of Wetonka; his brother, Mr. John F. Lundquist, of Washington, D. C.; his sisters, Mrs. Annie Kruger, of Wetonka, and Mrs. Selmer Anderson and Mrs. Ellen Anderson, of Jewett, Pennsylvania; and his wife's mother, Mrs. Elizabeth Reue.

Funeral services were conducted by Rev. E. A. Folley, of Webster, South Dakota, assisted by Rev. Grant Tooker, of Wetonka, S. D. Private services were held at the residence, and public services at the high school auditorium, where more than two thousand people were in attendance. Interment was at Wetonka, South Dakota. Members of the Aberdeen District Medical Society attended the services in a body.

J. F. D. C.

SOCIETIES

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Fergus Falls, Minn., August 31-September 1, 1936

1. "The Medical School and the Practising Physician," H. S. Diehl, M.D., University of Minnesota.
2. "Acute Abdominal Symptoms Complicating Diagnosis, With Case Reports," J. L. McLeod, M.D., Grand Rapids.
3. "Pilonidal Sinus and Its Treatment," W. G. Strobel, M.D., Duluth.
4. "Dyspnea and Dysphagia of Unusual Origin," D. J. Schwartz, M.D., Minneapolis.
5. "The Significance of Anatomical Features of the Vermiform Appendix in the Genesis of Acute Appendicitis," O. H. Wangensteen, M.D., University of Minnesota.
6. "Recent Developments in Anesthesia," E. B. Tuohy, M.D., Rochester.
7. "Hemorrhoidectomy: A Plastic Operation," Newton D. Smith, M.D., Rochester.
8. "Eyeground Examinations As an Aid to Prognosis in General Medicine," M. F. Fellows, M.D., Duluth.
9. "Chronic Hyperthyroidism," C. I. Krantz, M.D., T. O. Young, M.D., Duluth.
10. "Recent Advances in Diabetes Mellitus," W. Stafne, M.D., Moorhead.
11. "Some Fevers Difficult of Diagnosis, With Case Reports," Moses Barron, M.D., Minneapolis.
12. "Silicosis on the Iron Ranges," C. Raadquist, M.D., Hibbing.
13. "Symptomatology of the Various Leukemic States," T. A. Peppard, M.D., Minneapolis.
14. "Interpretation of Heart Murmurs," M. A. Shillington, M.D., St. Paul.
15. "Missed Abortion," W. F. Mercil, M.D., Crookston.

16. Clinic—"Neuro Psychiatry," Dr. W. L. Patterson and staff, Fergus Falls State Hospital for Insane.

Toastmaster—O. J. Hagen, M.D., Moorhead.

Guest Speaker (Banquet)—"The Vanishing Hosts"—W. L. Strunch, M.D., Decorah, Iowa.

President's Address—A. N. Collins, M.D., Duluth.

F. J. Hirschboeck, M.D.,
Chairman, Program Committee,
Duluth, Minn.

O. O. Larson, M.D.,
Secretary,
Detroit Lakes, Minn.

MINNESOTA STATE SANATORIUM CLINIC

March 14, 1936

DIAPHRAGMATIC HERNIA AND EVENTRATION OF THE DIAPHRAGM

H. A. Burns, M.D., Superintendent
Ah-Gwah-Ching, Minn.

CASE I: Diaphragmatic hernia, pleural effusion, pulmonary tuberculosis, cure of diaphragmatic hernia.

This case is one of a 17-year-old Indian boy who became sick during August, 1935. He was admitted to a local hospital where his chest was tapped four times. The diagnosis made at that time was pleural effusion and tuberculosis. Transfer to the Minnesota State Sanatorium occurred November 1, 1935.

On admission, definite physical signs of right-side pleural effusion were present. His Mantoux test, 1:1000, was positive, and an X-ray film of the chest was interpreted as showing thickened pleura throughout with pleural effusion at the base.

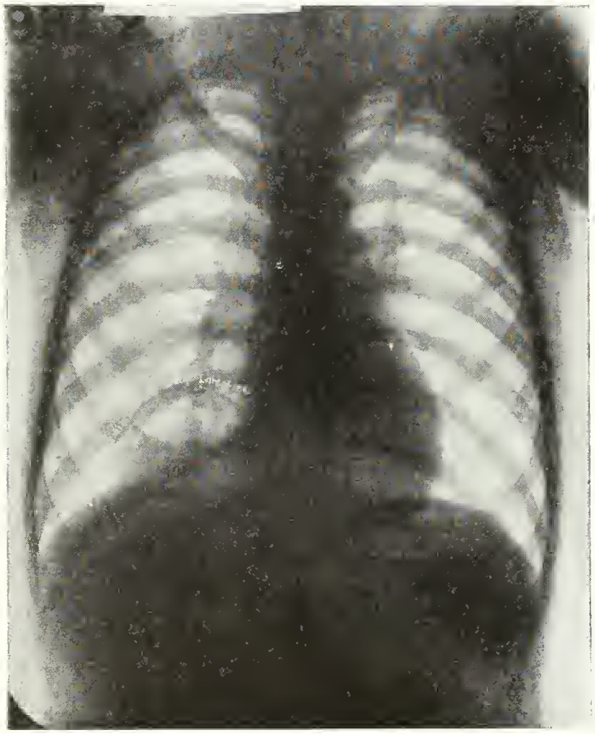

FIGURE I

Hernial sac occupying the right cardio-diaphragmatic angle. (1931)

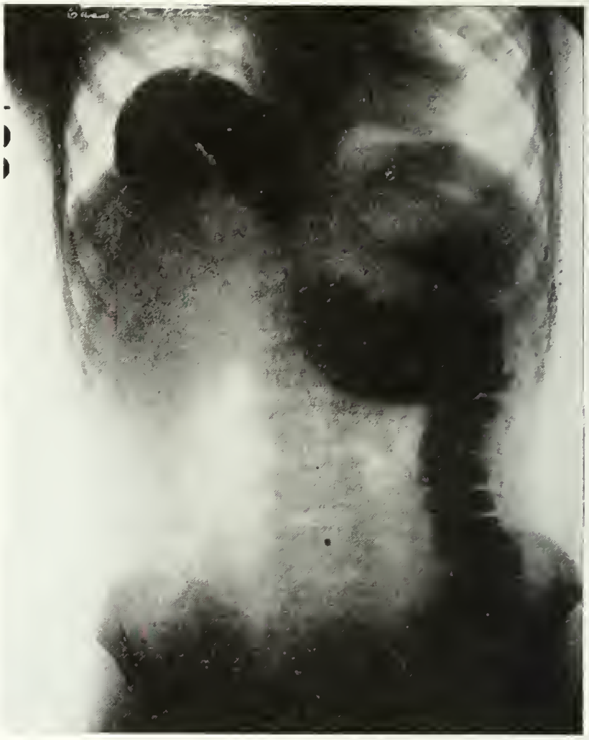

FIGURE II

Barium enema showing the large intestine extending up into the chest through the inner third of the diaphragm. (1931)

This patient, because of his positive Mantoux reaction, was X-rayed during an Indian Clinic operated by the State Board of Health in 1931. At this time it was found that he had a diagnosis of right diaphragmatic hernia, without evidence of parenchymal disease. The question arose as to whether or not the dense opacity occupying the lower portion of the chest following his present admission was not in part or entirely due to this hernial sac. At the time of admission the patient was toxic. Effort to determine the possible presence of a hernial sac in the dense basal shadow of the right lung was postponed until he was in better physical condition. Improvement continued for a few weeks. Late in December the symptoms increased, and physical and X-ray examination showed a marked increase of fluid formation. It was evident from his history and findings that this pleural disease was of four months' duration. On the last day of December, 1935, and again on the tenth of March, 1936, attempts were made by fluoroscopy, barium enema and motor meal studies and X-ray films to demonstrate the location of the gastro-intestinal tract in relation to the diaphragm. This study showed the abdominal viscera to be normally located in the abdomen. Frequent auscultation of the right chest failed to elicit bowel sounds above the diaphragm.

Comment: This case of diaphragmatic hernia is interesting from many angles. Although this condition is being much more frequently discovered, it is still rare, usually occurring on the left side. This case introduces the problem of differential diagnosis of a diaphragmatic hernia. They are usually to be differentiated from lung cyst, eventrated or paralyzed diaphragm, esophageal diverticula, and tumors of the

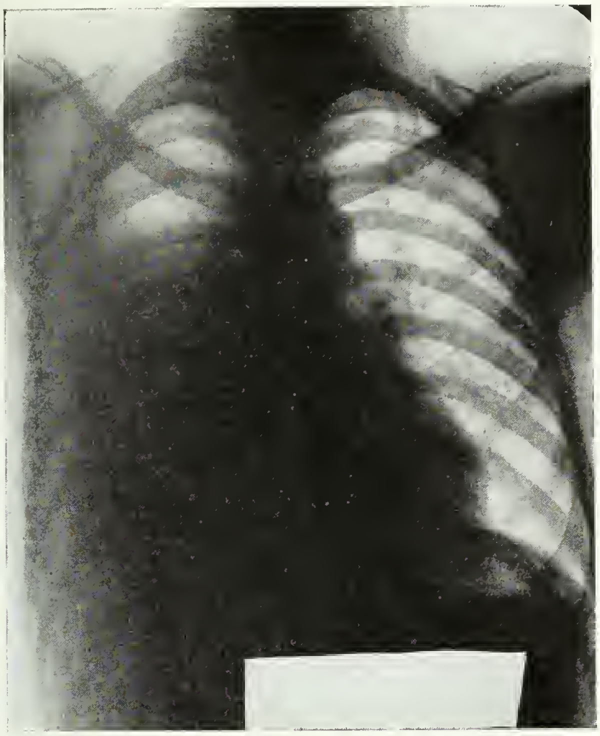

FIGURE III
Extensive effusion has completely occupied the base of the right thorax. (1935)

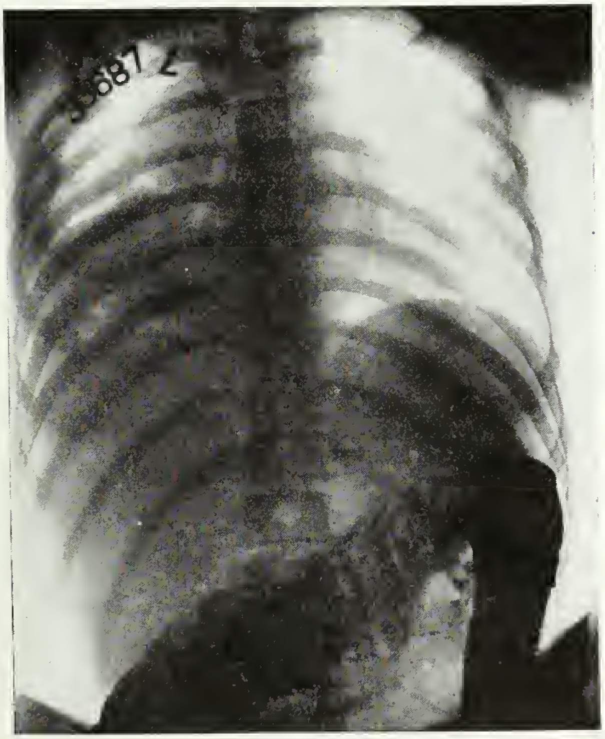

FIGURE IV
Location of large intestine following the effusion in right chest. (1936)

diaphragm. Because of the shadow in the right cardio-diaphragmatic angle, exact diagnosis became necessary and the patient was returned for further study, which confirmed the suspicion aroused on the first reading of the film. The lateral chest plate definitely localized the point of herniation as being through the anterior area of the diaphragm near the sternum.

The most interesting element in the study of this case is its relationship to the early manifestations of tuberculous disease, in this instance, pleurisy with effusion. All efforts to demonstrate herniation at the present time fail. Is it not possible that the four months of active pleural tuberculosis with effusion have so thickened and strengthened the hernial hiatus that it no longer exists? Normally the intraperitoneal pressure is slightly positive whereas that of the pleural cavity is negative. With the occurrence of pleural effusion the intrapleural pressure has changed to a positive, neutralizing the difference of pressure below and above the diaphragm. This change in pressure has no doubt influenced the return of the hernia into the abdominal cavity and the pleuritis has supplied sufficient additional support over the site to prevent an easy recurrence. Brown and Sampson reported a case of diaphragmatic hernia which sufficiently collapsed a tuberculous lung to control the disease. This case presents a reversal, since, in this instance, the tuberculous disease apparently has cured the diaphragmatic hernia.

CASE II: First infection tuberculosis, enervation of the diaphragm.

This second case is that of a two-year-old Indian boy who was nursed by a tuberculous mother. The mother died of tuberculosis during the first year of the child's life. He was admitted as a case of tuberculosis and on routine examination a high right diaphragm was found. Physical examination shows that the liver has ascended with the diaphragm. No other findings are apparent on physical examination. The patient was examined by fluoroscopy, lateral thoracic X-ray film, and barium enema study. X-ray plates show the diaphragm uniformly elevated throughout with normally placed attachments. Under the fluoroscope it was determined that this was a fully functioning hemi-diaphragm, which rules out a paralysis of the phrenic nerve, a condition which might follow a phrenic nerve operation or pressure along its route. There is no protrusion of the bowel above the diaphragm; its location is apparently normal. An enlarged liver as a cause of this elevated diaphragm does not seem likely since the liver appears to have ascended with the diaphragm. The evidence on palpation and percussion of the liver add further testimony to this fact. Sub-diaphragmatic abscess must be ruled out. There is no localized tenderness or pain. Neither is there a septic type of fever, nor chills, both of which usually accompany that condition. Brown pointed out that in subphrenic abscess the posterior diaphragm is elevated even to a higher level than the anterior portion, and the posterior costo-phrenic angle is obliterated. These signs are not present in this case. Furthermore, malfunction of the diaphragm is to be expected in subphrenic abscess, which is not found in the present case.

Enervation of the diaphragm is the one remaining possible explanation of this condition. This term is a misnomer, being employed by long usage as the description of the condition of the diaphragm when it raises above its normal level in the thorax without marked interference in the relationship of the contents of either the chest or abdomen. Other terms applied to this condition are "relaxation," "insufficiency," and "dilatation." In this case the high position, uniform contour and normal attachments of the diaphragm, as well as the persistence of function, all characteristics of eventration of the diaphragm, lead us to believe that this is the correct diagnosis.

CASE III: Pulmonary tuberculosis, tuberculous cervical adenitis, localized enervation of the diaphragm.

This case shows a localized enervation of the diaphragm in a 14-year-old Indian female who was admitted to the State Sanatorium August 28, 1935. The diagnosis on admission was pulmonary tuberculosis with cervical adenitis. On routine X-ray examination of the chest a peculiar spherical shadow is seen protruding up from the middle portion of the left diaphragm. The possibility of diaphragmatic hernia, localized pleural effusion, diaphragmatic tumor, subphrenic mass such as abscess or tumor, or localized insufficiency was considered. The case was studied under fluoroscopy with both barium enema and motor meal. Lateral plates of the diaphragm were made and the Seidlitz powder test as used to demonstrate herniae by Ball was used to study this abnormal shadow. Under the fluoroscope it was found that the shadow was present only on inspiration. On expiration the spherical elevation of the diaphragm blends with the contour of the remainder of the diaphragm. This observation rules out a tumor of the diaphragm, or a localized pleural effusion, for such local pathology should move synchronously with the diaphragm. This observation further points to a mass beneath the diaphragm holding it up in one place when the remainder descends on inspiration. Yet there is no discernible mass when palpating deep in the left upper quadrant of the abdomen. There is no pain or tenderness in this area. Examination of the urine is normal. Barium motor meal and barium enema demonstrate that the stomach and splenic flexure of the colon bear no relation to this diaphragmatic elevation. When given a Seidlitz powder and anterior and lateral X-rays are made, certain definite information is gained. The stomach distended with gas is seen to move into the area of this diaphragmatic elevation and surely this would not be possible if this were a tumor mass. We believe the evidence in this case supports the view that there is a localized insufficiency or enervation of the diaphragm. This could be due to either maldevelopment or atrophy of the muscle. This condition might easily lend itself in later life to the development of a diaphragmatic hernia, particularly if the individual is subjected to increased abdominal pressure, as in childbearing.

The relationship of the diaphragm to diseased conditions on its upper and lower surface is considered important. It is the roof or the floor for the housing of most of the important organs of the body. While any one of the many conditions affecting this muscular organ might not often occur, some of these conditions are frequently appearing in general practice. In cases admitted to the sanatorium, approximately 10 to 15 per cent show some condition in which the diaphragm is involved. Frequently these conditions are evidences of infection, as a sub-diaphragmatic abscess or pleural effusion with their residuals. In other instances there is interference with its function because of enervation, which may be local affecting only one leaf of the diaphragmatic muscle, or it may affect one half of the diaphragm or the total organ, weakening the wall in some portion to such an extent that herniation is possible. In weighing the evidence of pathology pointing towards interference with diaphragmatic function these factors must be borne in mind. The X-ray in conditions above the diaphragm, and roentgenogram plus the barium meal and the barium enema in conditions below it, are essential to a proper evaluation of any suspected disease in which the diaphragm is involved.

ADENOMA OF THE THYROID

Viktor O. Wilson, M.D.

The thyroid problem is one of great interest and importance to the general practitioner. The differentiation between the various types of thyroid pathology is essential if successful treatment is to be carried out. Prognosis, desirability of surgical intervention, the extent and time of such procedure must all be based upon a full knowledge of the pathology and physiology of the diseased thyroid. We are presenting at this time one case of toxic adenoma and two of non-toxic adenoma of the thyroid.

The first case presented is that of a 52-year-old white female whose principal complaints are cough, expectoration, palpitation and loss of weight. While she feels that her present illness began in October, 1935, she also states that for the past 12 to 20 years she has had a dry cough. During this time, she has been subject to repeated colds which remain for a varying period of time, during which considerable expectoration occurs. She has also complained of palpitation of the heart and rapid pulse. During last October she broke her right hip. Since then she has been expectorating more and has gradually lost in weight. Three months following this accident her chest was X-rayed because of the symptoms referable to her lungs and she was sent to the State Sanatorium. Her history shows that she has never had pneumonia, pleurisy, fever, night sweats, hoarseness, hemoptysis, or pains in the chest. Some years ago, she was sent to the North Dakota Sanatorium as a result of her cough and expectoration but was discharged from that institution after a short stay as non-tuberculous. Her menses ceased four years ago at the age of 48 years.

On physical examination the patient is found to be of hyposthenic habitus and quite emaciated. No abnormalities of the eyes are discernible. The tongue is coated and shows a tremor. The skin is soft, moist, and of fine texture. Palms of the hands are moist and the fingernails striated and brittle. Both hands show a pronounced tremor as does the tongue. In palpating the thyroid a hard nodule five centimeters in diameter is found in the right lobe. In the thyroid isthmus there is a smaller hard nodule which seems to extend deeply into the left lobe. No thrill can be palpated or bruit heard in the region of this gland. The pulse rate is 144 per minute and is slightly irregular. Many extrasystoles are heard yet they do not occur with any regularity. No enlargement of the heart borders can be found and no murmur can be heard. A systolic thrill is palpable at the apex. Careful and complete examination of the chest failed to elicit any pathological findings.

Listed among the laboratory findings is a positive 1:1000 Mantoux test. Wassermann tests were negative. Blood studies were entirely normal. Urinalysis showed no variation from normal. Basal metabolic studies showed rates of 55 and 66 per cent plus. Repeated direct smear and hydrocarbon flotation tests of sputum for tubercle bacilli failed to show them. A flat X-ray film of the chest showed marked fibrosis throughout both lungs with some pleural changes over the upper lobe on the right side. Interpretation of stereoscopic thoracic films reads, "peribronchial infiltration throughout. Apparently some fibrosis not characteristic of tuberculosis."

Comments: Of first consideration in this institution is the confirmation or refutation of tuberculous disease. For each case the criteria of the National Tuberculosis Association are the yardstick. In this case there was no history of exposure to tuberculosis or past disease which might indicate tuberculous infection. So the first two of the seven criteria are lacking. Physical signs, X-ray evidence, and positive sputum tests, three additional criteria necessary for the diagnosis of tuberculosis, are absent and for this reason add further testimony against such a diagnosis. The tuberculin test is positive and is the only diagnostic evidence in support of tuberculous disease.

Seventh among the diagnostic standards is "Exclusion of Other Causes," and it is here that the great stumbling block to the diagnosis of pulmonary tuberculosis is found. The patient complains of tachycardia and palpitation, a good appetite yet loss of weight, and enlargement of the neck or thyroid gland. On physical examination a tremor of the hands and tongue is found along with localized enlargement of the thyroid gland. With all of the cardinal symptoms, and the essential physical findings and high basal metabolic rate, the case can properly be classified as a toxic adenoma of the thyroid.

At the last clinic the treatment of exopthalmic goitre was discussed. This case raises the question of treatment of the toxic adenomatous type of thyroid. In discussing the use of iodine in such cases as the one presented, Crile states that while simple goitre in children may be prevented or cured by the administration of iodine, it cannot remove the adenomata either in children or in adults. Continuing his remarks, "On the contrary, if iodine is given over a period of time to children or adults having fetal adenomata, hyperthyroidism may be induced in a certain percentage of cases. In a small series of cases observed by Hartsock, adenomatous colloid goitres were apparently activated by the ingestion of iodized salt." Cameron finds that the existing opinion is conflicting. Though, as he says, the Mayo school believes that no benefit is conferred by iodine, certain authors state definitely that it is just as effective in toxic edenoma as in exopthalmic goitre. However, the majority of opinion supports the viewpoint that iodine is not effective in toxic adenomas.

Two other methods of treatment are now in vogue, namely: radiotherapy and surgery. Portmann of Crile's clinic believes that irradiation of adenomatous goitre with toxic symptoms reduces the toxicity even though the size of the adenoma may not be increased. Fenger, as described by Cameron, concludes that if 100 cases are submitted to medical and an equal number to surgical treatment, the latter will cure about twice as many as the former, and X-ray therapy will not materially change the result. Plummer of the Mayo Clinic points out that patients operated on for adenoma of the thyroid scarcely ever have a recurrence of the condition; recurrences, he believes are much more frequent with exopthalmic goitre.

Two other cases having nodular thyroid glands will be presented inasmuch as each is believed to represent a diagnostic and a therapeutic problem.

This is the case of a 35-year-old white female, whose present illness began with weakness and drowsiness six years ago. At that time she had a slight cough but did not expectorate. She was tired and weak, had no appetite, and lost weight. Although these symptoms persisted she continued to work until four years ago when, following an X-ray study of the chest, a diagnosis of tuberculosis was made. From that time on she has not worked but has carried out a rest regime. All of the symptoms have persisted but have improved until two months ago when the patient caught a cold. Since then she has noticed unlocalized and inconstant pains in the chest. Her cough increased following the last cold yet she does not expectorate.

Her history by systems contains some points of interest. She states that she has for years had headaches which are present as much as two or four days of each week. These are worst just before her menstrual period. Several years ago she was told that she had "goitre trouble." Though she had influenza in 1918, she has never had pneumonia, pleurisy or other respiratory symptoms or disease. In 1925 she was sent home from work due to heart trouble and since that time periodically she has palpitation, edema of the ankles, dizziness, and dyspnoea. Three years ago she was treateded for colitis, and even now has flatulence, belching, nausea, and alternate diarrhea and constipation. Her menses started at the age of 13 years. When she was 16 years old her menses stopped for three months, and since that time they have stopped occasionally for one or two months. The periodocity has decreased from 28 to 21 days in the past six years. Their duration during the past six months has decreased from five or six to four days and the quantity varies from "very light to unusually heavy." No one in the family and no close friends or associates have ever had tuberculosis that she knows of.

Physical examination showed very little of importance. She is a tall hyposthenic type of individual. Pupils are eccentrically placed in the cornea, the iris laterally being much wider than medially. No eye signs are present. The thyroid shows several nodules in the isthmus and in the lower pole of the right lobe. Cardiac examination was negative. Blood pressure readings showed the systolic pressure to be 155, the diastolic 90. Only on inspection did examination of the chest show abnormality, there being marked asymmetry, the right hemithorax being smaller than the left. Pelvic examination was not significant. Axillary, pubic and head hair is thin and scanty. Axillary folds are deeply pigmented. There was a fine tremor to the fingers. Throughout this patient's stay in the sanatorium her pulse rate has varied from 59 to 92, and her temperature has been within normal limits. Her weight has remained practically stationary.

Laboratory work showed a normal urinalysis, Wassermann and agglutination tests. Hemoglobin was 72 per cent; red blood cell count, 4,450,000; white blood cell count, 8,700, and the differential blood count was within normal limits. Tuberculin tests, including one of 1:10 concentration, were negative. Hydrocarbon flotation test and direct smear of sputum failed to show tubercle bacilli. There is some mottling in the right first and second interspaces of the X-ray film of the chest, which is suggestive but not typical of pulmonary tuberculosis. Metabolic studies showed rates of 16 and six per cent plus, and one of minus 5½ per cent. An X-ray of the sella turcica showed it to be near the upper limits of normal. Sugar tolerance test values produced a low flat graph and the fasting blood sugar was 71 mg., both of which indicate a high sugar tolerance.

It is felt that she constitutes a diagnostic problem. Up to the present time evidence does not seem sufficient to support a diagnosis of pulmonary tuberculosis. She does not give a history of exposure, or a history of pneumonia, pleurisy, or any of the symptoms of tuberculosis. Physical and laboratory examinations are opposed to a tuberculous diagnosis. Roentgen-ray films are suggestive but since this is the only one of the seven diagnostic standards which has been met, and since other diagnoses cannot be ruled out, it is not the consensus of opinion that this diagnosis is tenable. The tremor, palpitation, menstrual irregularities and palpable nodules in the thyroid gland seem to suggest a diagnosis of adenoma of the thyroid. In fact, adenomata of the thyroid gland are demonstrable. The diagnostic question is, do these constitute the primary pathology or are they coincidental findings. With a basal metabolic test of minus five per cent, hyperthyroidism or thyroid toxicity can scarcely be claimed. What diagnosis will explain all the findings? A tall, slender woman with headaches, multiple complaints including menstrual irregularities provokes thought of pituitary dysfunction. All of these are included in such a syndrome and when scanty hair growth, a low basal metabolism, high sugar tolerance, low fasting blood sugar and X-ray evidence of such pathology are also found, pituitary dysfunction is a justifiable diagnosis.

Treatment of the thyroid nodules in this case constitutes "watchful waiting" and the true therapeutic approach is glandular directed toward the pituitary.

This third case is that of a 19-year-old white girl who states that in 1932 she first noticed a swelling on the right side of the neck. It was not painful and has not been painful since. During October, 1934, she developed a slight fever and general malaise. She saw a doctor who took an X-ray film of the chest and told her that she had pulmonary tuberculosis. A basal metabolic test at the time was normal. Since that time she has had fever occasionally and also pain in the left side of the chest. Infrequently she coughs but only expectorates when she first awakens in the morning. She is subject to frequent colds but they do not last long nor are they severe.

Physical examination reveals an atrophic right hand and arm, an elevated left shoulder and restricted motion of the left elbow—all of which defects have been present since birth. Physical examination of the chest reveals left upper lobe vocal fremitus, lag, impaired resonance, and moderately coarse rales, consistent with a diagnosis of upper lobe pulmonary tuberculosis. Regarding the tumor in the neck one finds a soft tumor mass on the side of the neck in the region of the right lobe of the thyroid gland. It moves during swallowing, is not tender, and is not adherent to the underlying tissues. No other nodules or glands are palpable in this region. This mass does not transilluminate, and it is felt that it is an adenoma of the thyroid.

Among laboratory tests, the Mantoux test was positive, as was the interpretation of the X-ray film. Sputum tests did not show tubercle bacilli. The basal metabolic test showed a rate of minus five. Other laboratory aids were not pertinent.

This case differs from the other two in several respects. In the first place, she has left upper lobe pulmonary tuberculosis, whereas such disease could not be determined in the other cases. Secondly, this case introduces the question of differentiation of this nodule from cervical adenitis of tuberculous origin. Its location, its consistency, its freedom from matting to surrounding tissues, its motion on swallowing, and the lack of other lymphatic involvement point to its location in the thyroid. Thirdly, the age incidence of this case is much lower than the others and conforms with the views of several authors regarding the age of development of endemic or colloid goitres. Finally, with a low basal metabolic rate, it cannot be a toxic adenoma, leaving only the possibility of its being a simple non-toxic adenoma.

The Treatment of the non-toxic adenoma of the thyroid in a patient of her age is best delayed until evidence of toxicity appears. As stated before, if treatment is desirable, surgery is perhaps the best.

NON-TUBERCULOUS PATIENTS RECENTLY ADMITTED

Edwin J. Simons, M.D.

In addition to the cases described by Dr. Wilson, two other patients having as part of their clinical symptoms weakness, tiredness, gastric distress and loss of weight, have been admitted to the sanatorium since the last clinic. All of these symptoms play a prominent role in the symptomatology of tuberculosis. In each of these cases, discovery of the true cause of the disease could not be made because facilities were not available to the attending physician. Both patients are Indians, one of whom could talk little English, and the other case presented such a confusing history at first that the underlying cause was greatly obscured.

This first case is that of a 14-year-old Indian girl whose principal complaints are loss of weight, fatigue, nausea and vomiting, dizziness and headache. Although she has always had periods of severe nausea, vomiting, dizziness and headache, her present illness, she believes, began in November, 1935. Then she became sick at her stomach and developed a severe headache, and later she was very dizzy and vomited several times. At about that same time her menses first appeared. For several days her dizziness, headache and vomiting intermittently recurred. Following each such experience she was weak and tired for 24 to 48 hours. Since November her menses have reappeared at regular intervals and the headaches have not been so severe, except during the menses. Dizziness and vomiting associated with the cephalalgia have not occurred since November, yet she continues to be weak and to tire easily.

Discussing the headaches, she states that first the pain in the head develops, she then becomes dizzy and if she can vomit several times the dizziness vanishes and later the headache disappears. Usually the pain is on the right side of the head; sometimes it involves the left side; infrequently the pain is spread diffusely over the whole head. Ordinarily she can eat anything or as much as she wishes, but, when the headaches begin, she must be very careful of her food and also of how much she eats. No certain foods seem to cause the headaches. Constipation leads to the headaches. During prolonged headaches her weight decreases she believes, although she has gained weight since last November. Her mother has had similar headaches for years. Her physical examination fails to show any pathological findings. Laboratory data fail to reveal any departures from normal even in blood studies, tuberculin or sputum tests. The X-ray of her chest is entirely normal, but an X-ray of the skull shows a small sella turcica.

The syndrome of unilateral headache accompanied by nausea and vomiting constitutes the entity of migraine. With all evidence of other disease lacking, including that of tuberculosis, and with several salient facts supporting such a conclusion, migraine is the most acceptable diagnosis.

This case is of interest in that her history points to all three of the usually described etiological agents in migraine: heredity, allergy and endocrine factors. Her mother has had such headaches, which fact constitutes an hereditary background. According to Miller and Raulston, there is definite evidence that migraine is anaphylactic in nature. In this regard, Brown includes among his four groups of migraine those associated with true intestinal toxemia caused by the decomposition products of protein digestion. In this case there appears a positive relationship between the headaches and constipation. Thirdly, Timme has noticed that among other endocrine dysfunctions, disturbances in the gonadal organs and pituitary inadequacy, especially the small type of sella turcica, lead to migraine. In this case there is a definite periodocity and association with menses attributable to either ovaries or pituitary, and the X-ray shows a small sella turcica.

As a second case, Dr. Burns suggested that of a 74-year-old Indian male. Both history and physical examination have been difficult to complete in view of the fact that even with an interpreter's help the subject does not understand the information desired.

His principal complaints are shortness of breath, ease of fatigue, loss of appetite and abdominal pain. For several years he has periodically been subject to indigestion. Asked to describe his indigestion he says that he has a poor appetite and at times vomits. He has no true abdominal pain. Also he has periods of diarrhea interspersed with constipation. During diarrhea he has little control of his bowels and often he cannot control urination, this reaching a state of incontinence at times. Occasionally his mouth and tongue have been sore, yet, recently when his tongue was sore, after he had a tooth extracted, the soreness decreased. For a week before admittance he had profuse bleedings from the nose which have recurred almost daily. Through the past few months he has steadily been growing weaker, has been increasingly more short of breath, and becomes exhausted very easily. He has no respiratory symptoms or disease. It has been impossible to obtain a more detailed history in this case.

Significant findings in the physical examination are: The patient is a well developed and well nourished, adult, male Indian. His pallor is apparent in spite of his natural pigmentation. Crusted blood was seen in both nares. Later, bleeding points or small excoriations of the mucous membrane were found in the lower portion of the septum. Pyorrhea and dental caries are easily visualized. The tongue is pale and smooth except for deep fissures in the center. In the center of the anterior portion is a small circular area of redness. The borders of the tongue are atrophic. The cardiac rhythm is irregular, there being frequently but not constantly recurring extrasystoles. While the tones are clear, they are faint and no murmur can be heard. Systolic pressure is 144, the diastolic 74. Examination of the lungs fails to demonstrate any pathology. Testing the reflexes showed no abnormalities except that both knee jerks were hypoactive, those of the right side being less active than those of the left. The vibratory sense was found to be markedly impaired.

Though his Mantoux test was positive, all sputum tests were negative and the findings on the X-ray film were not typical of pulmonary tuberculosis. With a history devoid of evidence of tuberculosis, the X-rays, physical examination and laboratory work, except a tuberculin test, opposed to such diagnosis, tuberculosis is ruled out. Among the other diagnoses suggested by both history and physical examination, pernicious anemia is the most likely. Shortness of breath, fatigue, epigastric distress, diarrhea and constipation, glossitis, neurological symptoms, weakness and epistaxis, all are found in the symptomatology of pernicious anemia. His state of good nutrition in the face of pallor, weakness and dyspnoea, a smooth tongue with atrophic borders, and impairment of the vibratory sense all support a diagnosis of pernicious anemia.

Nevertheless, there are certain questions which are raised. This patient is a 74-year-old Indian. Though there is a marked paucity of scientific medical literature concerning the American Indian, no previous case report of such an entity among the Indians has been found. Among white persons pernicious anemia usually appears between the ages of 20 and 60, and it is rare after 60 years of age. Another confusing fact is that this Indian has lived in a primitive state eating fish and game. The fishes of many of Minnesota's lakes have been found infested with embryonal forms of bothaiocephalus latus. Could this be an example of anemia secondary to such tapeworm infestation? Such severe and profuse epistaxis could cause a pronounced secondary anemia, yet, also, it is a manifestation of other blood dyscrasias. Then, too, is it not possible that this is a case of aplastic anemia?

Complete daily blood studies cannot be included here, yet sufficient work can be described to determine the diagnosis. Hemoglobin by the Sahli method was found to be 32 per cent. The red blood cell count was 1,130,000. These values show a color index of 1.4 which suggests hyperchromasia, macrocytosis and pernicious anemia. Differential counts, when the total white cells numbered 2,800, showed 53 per cent polynuclear cells, 45 per cent lymphocytes, and two per cent eosinophiles. An absolute leucopenia with a relative lymphocytosis is characteristic of primary anemia. Of the polynuclear cells one had one lobe, 18 had two lobes; 20, three lobes; 10, four lobes; and four, five lobes. Increased segmentation or Arneth's shift to the right, as shown here, is typical of idiopathic anemia. Other differential counts showed higher lymphocytosis and the presence of more highly segmented polynuclear cells than the count given. Platelets numbered 28,000. Red cells showed slight poikilocytosis, moderate anisocytosis, numerous macrocytes and slight polychromasia. Gastric contents, both fasting and after test meal, showed no free hydrochloric acid and only 10 and 7.5 units of combined acid, respectively. Urobilin and urobilinogen were found in the urine. Reticulocytes when first counted constituted only 1.5 per cent, a slight increase over the normal 0.2 per cent. The stools showed no ova of any kind. These findings appear to substantiate the diagnosis of pernicious anemia tentatively made from the history and physical examination.

Consequently he was given intramuscular injections of concentrated liver extract. Such extract can be given intravenously if more rapid response is desired. In this instance he was given intramuscularly three cubic centimeters of the extract each day for two days and the fourth day the balance of the ten cubic centimeter vial was given. At the same time the intravenous medication was started he was given 12 liver extract capsules daily. Usually under liver therapy the reticulocyte response is apparent by the third day and reaches an average maximum of 15 to 25 per cent by the seventh or ninth day. Minot and Castle recommend the use of iron ammonium citrate up to ten grams daily when profuse bleeding occurs in pernicious anemia. Four grams a day were given to this patient due to the epistaxis. In an effort to relieve the epigastic distress 1½ teaspoons of dilute hydrochloric acid were given daily.

Within three days of the institution of the therapy his reticulocyte count increased and it reached its maximum, 12.8 per cent, by the ninth day. The epistaxis stopped, and symptomatically, he has improved markedly. Fifteen days after active therapy was started, his hemoglobin was 61 per cent, his red blood cell count was 2,850,000 giving a color index of 1.03, and his platelet count has increased to 202,350. Also the differential white blood cell count shows a decreased relative lymphocytosis. The macrocytosis is still apparent and the reticulocyte count is now remaining about five per cent.

Perhaps the first question raised by this case is whether the bleeding from the nose has been prolonged or profuse enough to cause such a severe anemia as this, or is the epistaxis a manifestation of pernicious anemia. In fact, is this a severe secondary or a pernicious anemia case? His efforts to obtain medical relief during the past year or two and the onset of epistaxis within a few days of his admittance suggests the epistaxis is a result and not the cause of the anemia. McAlpine has named the criteria necessary for the diagnosis of pernicious anemia as follows: Achlorhydria, especially while fasting, a low cell count with a high color index and megalocytosis, and lastly, glossitis, which he admits does not always occur, but, when present, forms a valuable diagnostic link. This case possessed all these features. Gradwohl describes 18 features of the blood study characteristic of pernicious anemia. This case possessed all except three of these features. Even though rare, aplastic anemia has to be considered in the present differential diagnosis. Regenerative response of the bone narrow, positively, and other features, suggestively, rule this possibility out. Diphyllobothrium anemia was excluded by failure to find ova in the stool. Several years ago one investigator pointed out that when barium meals are given to persons having tape-worms, soon after the barium is passed from the intestinal tract the tapeworm can be visualized by the barium it has ingested. This test further proved the absence of tape-worm infestation. Wassermann tests were negative so it could not be a luetic anemia. Carcinoma of the stomach was not possible after a negative study of the gastrointestinal tract by X-ray and fluoroscopy. Under these conditions, that is, since the case meets the requirements for the diagnosis of pernicious anemia, and since none of the other diseases entering in the differential diagnosis can be proved, pernicious anemia appears to be the diagnosis of choice.

NEWS ITEMS

Dr. Wm. J. Mayo, Rochester, observed his 75th birthday on June 29 with a quiet dinner at his family home.

Dr. G. J. Mouritsen, formerly of Minneapolis, has joined the staff of Drs. Estrem and Heiberg, of Fergus Falls, Minn.

Dr. F. C. Lendrum, formerly of Madison, Wis., is now associated with the Bartron hospital at Watertown, S. D.

Dr. J. H. Phillips, formerly at Los Angeles, Calif., has moved to Bozeman, Mont., and opened offices for general practice.

Dr. M. J. McKenna, formerly of Graceville, has moved to Grand Rapids, Minn., where he will continue general practice.

Dr. Edward Starr Judd, son of the late Dr. Judd of Rochester, was recently married to Miss Virginia Helm, of Minneapolis.

A $30,000 addition is being made to the St. Joseph's hospital at Mitchell, S. D., which will cover many needed improvements.

A $250,000 addition to the General Hospital, Minneapolis, will be made this summer, which is badly needed to relieve congestion.

Dr. A. D. McCannel, Minot, N. D., was a guest speaker at the Canadian Medical Association last month at Victoria, Canada.

Dr. Irvin L. Mitby, a graduate of the University of Minnesota, has opened offices for general practice at Faribault, Minn.

Dr. Chris Johnson has joined his brother, Dr. O. W. Johnson, at Rugby, N. D., and they have opened new offices for general practice.

Dr. W. F. Cogswell, Helena, secretary of the Montana State Board of Health, is spending several weeks in Honolulu, on his summer vacation.

Dr. J. Elder, a recent graduate of the University of Minnesota, is now located at St. Bonifacius, Minn., where he has opened offices for general practice.

Dr. and Mrs. J. G. Vigeland, of Minnewaukan, N. D., celebrated their silver wedding anniversary last month, with several hundred friends being present at their home.

Dr. V. G. Borland has become associated with Hanna, Clay and Lancaster, clinic at Fargo, N. D. Dr. Borland is a graduate of the University of Minnesota.

Dr. J. E. Mannion, Platte, S. D., who has moved to Wisconsin Rapids, Wis., was honored by a community picnic by a large circle of friends before leaving for his new home.

Dr. Henry T. Nippert, who was in active practice for many years in Minneapolis and St. Paul, was drowned at his summer home at Park Rapids, Minn., last month.

Dr. C. J. Lundquist, Leola, one of South Dakota's pominent physicians and a member of THE JOURNAL-LANCET editorial board, passed away recently from the results of an auto accident.

Drs. Bernhard J. Cronwell, Austin; Wilfred P. Freligh, Albert Lea; Julius Johnson, Minneapolis; and E. Lawrence Myer, Minneapolis, are new members of the Minnesota Historical Society.

Members of the Upper Mississippi Medical Association will hold their annual summer outing at Cass Lake, Minn., on August 2. Dr. R. W. Campbell is in charge of the arrangements.

Dr. Ancel Keys, former lecturer in biochemical sciences at Harvard University, has become a member of the division of biochemistry of the Mayo Foundation and consultant in the section on metabolism.

New officers of the Wabasha County, Minn., Medical Society are: Dr. B. A. Flesche, Lake City, president; Dr. J. S. Collins, Wabasha, vice-president, and Dr. W. F. Wilson, Lake City, secretary.

Dr. R. S. Werner, who has been located in California for the past five years, has opened offices for general practice at International Falls, Minn. Dr. Werner was a graduate of the University of Minnesota in 1926.

Dr. O. H. Gerdes, who has been in active practice at Eureka, S. D., for over 43 years, died at his home on July 2 at the age of 68 years, after an illness of many months. Dr. Gerdes was a graduate of Rush Medical College in the class of 1892.

Trinity Hospital, Minot, N. D., was one of the first 20 hospitals in the United States, so far as its autopsy percentage was concerned. It ranked fifteenth in this list of hospitals, having an average autopsy percentage of 74 for the year ending December 31, 1935.

Dr. John Milton Armstrong, St. Paul, has presented the original commission of his father, George W. Armstrong, to the Minnesota Historical Society. Dr. Armstrong's father was commissary-general and treasurer of Minnesota Territory in 1856 and 1857.

Dr. O. T. Flores, of Dodge City, Minn., entertained the members of the Steele County Medical Society at a dinner party at the country club, where a most enjoyable time was had in playing golf and other sports during the afternoon and evening. A very thoughtful act on the part of Dr. Flores.

The annual meeting of the members of the Medical Association of Montana, held at Billings last month, elected the following officers: Dr. J. A. Everett, Glendive, president; Dr. W. P. Smith, Columbus, president-elect; Dr. H. G. McGregor, Great Falls, vice-president; and Dr. E. G. Balsam, Billings, secretary. The 1937 meeting will be held at Great Falls.

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Tuesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: August 4, "Low Blood Pressure"; August 11, "When School Starts"; August 18, "Iron and Anemia"; August 25, "Jaw Tumors."

Dr. G. M. Williamson, secretary of the North Dakota state board of medical examiners, announces the following list being admitted to practice medicine and surgery in that state: Harold C. Johnson and Francis W. Ford, Casselton; Herman J. Bertheau, Linton; Max E. Pickworth, Grand Forks; George H. Mitchell, Milnor; Verl G. Boreland, William C. Ferguson and Oliver A. Sedlak, Fargo; Theodore W. Stransky, Wahpeton; Theodore D. Englehorn, Medora; and William A. Moore, Marmarth.

The annual meeting of the Great Northern Railway Surgeons' Association will be held September 25 and 26 at the Olympic Hotel, Seattle, Wash. A scientific program will be presented Friday morning, September 25. The annual golf tournament will be held Friday afternoon at the Seattle Club; also, a yachting tour has been arranged for the ladies and the non-golfers, on Lake Washington, Friday afternoon. The annual banquet will be held Friday evening at the Ranier Club. A Fracture Clinic will be presented Saturday morning, September 26, at the Providence Hospital under the direction of Dr. H. J. Knott. Saturday afternoon the members will attend the Minnesota vs. Washington football game.

The International Assembly of the Inter-State Postgraduate Medical Association of North America, under the presidency of Dr. David Riesman of Philadelphia, will be held in the public auditorium of St. Paul, October 12, 13, 14, 15 and 16 with pre-assembly clinics on Saturday, October 10, and post-assembly clinics Saturday, October 17, in the hospitals of St. Paul. The aim of the program committee, with Dr. George Crile as chairman, is to provide for the medical profession of North America an intensive postgraduate course covering the various branches of medical science. The program has been carefully arranged to meet the demands of the general practitioner, as well as the specialist. Extreme care has been given in the selection of the contributors and the subjects of their contributions. In co-operation with the Minnesota State Medical Association, the Ramsey County Medical Society will be host to the Assembly and has arranged an excellent list of committees who will function throughout the Assembly. A most hearty invitation is extended to all members of the profession who are in good standing in their State or Provincial Societies to be present and enjoy the hospitality of the medical profession of the Twin Cities. A registration fee of $5.00 will admit each member of the medical profession in good standing to all the scientific and clinical sessions. Special railroad rates will be in effect. For further information, write Dr. W. B. Peck, Managing-Director, Freeport, Ill.

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LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON MAY 4, 1936

(APRIL EXAMINATION)

Name	School	Address
Allen, Pliny Arunah	Harvard U., M.D., 1934	Mayo Clinic, Rochester.
Barr, James Adam	Stanford U., M.D., 1934	Mayo Clinic, Rochester.
Bender, James Howard	U. of Minn., M.B., 1935	428 8th Ave., Two Harbors, Minn.
Bowers, John Gerald	U. of Minn., M.B., 1933, M.D., 1934	Wm. J. Seymour Hospital, Eloise, Mich.
Burlingame, David Albert	U. of Minn., M.B., 1935	Mazeppa, Minn.
Chessen, James	U. of Wis., M.D., 1935	Virginia, Minn.
Corson, Ada Catherine	U. of Minn., M.B., 1935	Minneapolis Gen. Hospital, Minneapolis.
Concklin, Charles Lewis	U. of Minn., M.B., 1935	Minneapolis Gen. Hospital, Minneapolis.
Deagen, James Richard	U. of Minn., M.B., 1935	Ancker Hospital, St. Paul.
Earl, John Robert	Harvard U., M.D., 1933	1210 Lowry Med. Arts Bldg., St. Paul.
Eckhardt, Carl Lambert	U. of Minn., M.B., 1935	Asbury Hospital, Minneapolis.
Ehmke, Edwin Charles	U. of Minn., M.B., 1935	Asbury Hospital, Minneapolis.
Frey, Norbert Bernard	U. of Minn., M.B., 1935	4344 Dupont Ave. S., Minneapolis.
Goldberg, Milton	U. of Minn., M.B., 1936	Minneapolis Gen. Hospital, Minneapolis.
Grau, Robert Kenneth	U. of Iowa, M.D., 1933	366 N. Prior Ave., St. Paul.
Groff, Jesse Emmert	U. of Cincinnati, M.D., 1934	Mayo Clinic, Rochester.
Hartmann, Clarence Melchior	Creighton U., M.D., 1935	Fairfax, Minn.
Heidrich, Otto Fred	U. of Minn., M.B., 1935	Echo, Minn.
Hill, Robert Jodoin	U. of Minn., M.B., 1935	237 E. 7th St., St. Paul.
Hoffman, Walter Lees	U. of Minn., M.B., 1935	Miller Hospital, St. Paul.
Hutton, John Huntington	U. of Mich., M.D., 1927	Mayo Clinic, Rochester.
Jewett, Robert Emmett	Indiana U., M.D., 1934	Mayo Clinic, Rochester.
Johnson, Percy	U. of Minn., M.B., 1935	Hendricks, Minn.
Johnson, Robert Emanuel	U. of Minn., M.B., 1935	4835 Penn Ave. S., Minneapolis.
Kelly, Hobart Martin	U. of Wis., M.D., 1932	Mayo Clinic, Rochester.
Kendrick, Thomas Douglas	U. of Toronto, M.B., 1928, M.D., 1929	Mayo Clinic, Rochester.
Kermott, Louis Henry	Rush Med. Col., M.D., 1935	Mayo Clinic, Rochester.
Kraft, Haldon Charles	Indiana U., M.D., 1930	Mayo Clinic, Rochester.
Laird, Donald Roth	Rush Med. Col., M.D., 1934	Mayo Clinic, Rochester.
Lenz, Bernard Thomas	U. of Minn., M.B., 1935	Minneapolis Gen. Hospital, Minneapolis.
Lysne, Myron	U. of Minn., M.B., 1935	700 W. Broadway, Minneapolis.
McDaniel, J. Zeb	U. of Georgia, M.D., 1932	Mayo Clinic, Rochester.
Merricks, James Wesley, Jr.	Rush Med. Col., M.D., 1934	Mayo Clinic, Rochester.
Middleton, Anthony Wayne	U. of Pa., M.D., 1934	Mayo Clinic, Rochester.
Moody, Leonard Wood	Rush Med. Col., M.D., 1935	Dorset, Minn.
Mortensbak, Hjalmar Erwin	U. of Minn., M.B., 1935, M.D., 1936	Hanska, Minn.
Mount, William Maxwell	Indiana U., M.D., 1934	Mayo Clinic, Rochester.
Mouritsen, Glenn Jesse	U. of Minn., M.B., 1935	Ancker Hospital, St. Paul.
Mousel, Lloyd Harvey	U. of Neb., M.D., 1930	Mayo Clinic, Rochester.
Nevitt, Donald Marion	U. of Minn., M.B., 1935	Bethesda Hospital, St. Paul.
Nilles, Leonard John	U. of Minn., M.B., 1935	Rollingstone, Minn.
Nissen, Archie Sophus	U. of Minn., M.B., 1934, M.D., 1935	State Hospital, St. Peter, Minn.
Noonan, William Joseph	U. of Chicago, M.D., 1935 (Div. Biological Sciences)	950 E. 59th St., Chicago, Ill.
Olsen, Arthur Martin	Rush Med. Col., M.D., 1935	Mayo Clinic, Rochester.
Pasek, Antone William	U. of Minn., M.B., 1935	804 Carlton Ave., Cloquet, Minn.
Proeschel, Ray Kenneth	U. of Minn., M.B., 1935	St. Mary's Hospital, Duluth.
Puumala, Reino Hendrick	U. of Ill., M.D., 1934	1108 Cloquet Ave., Cloquet, Minn.
Rudin, David N.	U. of Minn., M.B., 1936, M.D., 1936	812 Washington Ave. S. E., Minneapolis.
Schleinitz, Fritz Bruno	U. of Minn., M.B., 1935	St. Mary's Hospital, Minneapolis.
Schmidt, Walter Robert	U. of Minn., M.B., 1934, M.D., 1935	Ancker Hospital, St. Paul.
Schweiger, Theodore Robert	U. of Minn., M.B., 1935	Ancker Hospital, St. Paul.
Seltz, Herman	U. of Minn., M.B., 1935	Minneapolis Gen. Hospital, Minneapolis.
Siegel, Clarence	U. of Minn., M.B., 1935	706 Cleveland St., Eveleth, Minn.
Silver, Henry	U. of Minn., M.B., 1935	St. Mary's Hospital, Minneapolis.
Simons, Stanley John	U. of Minn., M.B., 1935	Akeley, Minn.
Sinykin, Melvin Bernard	U. of Minn., M.B., 1935	Michael Reese Hospital, Chicago, Ill.
Smith, Lucian Anderson	Rush Med. Col., M.D., 1935	Mayo Clinic, Rochester.
Sprague, Randall George	Northwestern, M.D., 1935	Mayo Clinic, Rochester.
Swift, Edward Virginius	U. of Texas, M.D., 1933	Mayo Clinic, Rochester.
Underdahl, Laurentius Olaves	U. of Minn., M.B., 1935	Ancker Hospital, St. Paul.
Washburn, Richard Nathaniel	Rush Med. Col., M.D., 1935	Mayo Clinic, Rochester.
Young, Henry Herman	Rush Med. Col., M.D., 1935	Mayo Clinic, Rochester.

BY RECIPROCITY

Coventry, William Dean	U. of Mich., M.D., 1930	205 W. 2nd St., Duluth.
Crawford, Helen Lucile	Rush Med. Col., M.D., 1930	Winona General Hospital, Winona.
Doehring, Carl Frederic	Rush Med. Col., M.D., 1928	Mayo Clinic, Rochester.
Trandem, Clarinda Elinor	Woman's Med. Col., Pa., 1929	285 Lafond St., St. Paul.
Wolfe, Albyn Garrett	U. of Ill., M.D., 1934	Miller Hospital, St. Paul.

BY NATIONAL BOARD

Wells, Arthur Herman	Harvard U., M.D., 1930	1820 Jefferson, Duluth.

(Continued)

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The Relationship of Tuberculosis to the Tuberculodermas[*]

Henry E. Michelson, M.D.[†]
Minneapolis

THE natural history of tuberculosis should be our guide in establishing an approach to the subject of cutaneous tuberculosis. When one has critically reviewed the literature and his own material over a period of years, and has realized what a struggle exists between the invading bacillus and the resisting forces of the host, one is better able to understand the different phases of activity and quiescence, and one is convinced that the characteristics of a tuberculous skin lesion at a given time do not display the diagnostic criteria that were present at some time in the life history of that particular manifestation; still the host, even though altered allergically, is one and the same, and the organism is still the tubercle bacillus. Obviously, then, arbitrary classifications with sharply drawn boundaries can only be applied to lesions at the moment, and accurately only to the stabile form of tuberculodermas, and should not be imposed upon labile, rather rapidly changing tuberculous skin lesions.

Sir Robert Philip[1] has briefly summed up the life history of tuberculosis as follows: "Tuberculosis, like other infective processes, is of simple origin. There is a moment in time when the tubercle bacillus passes the protecting barrier —the mucous membrane most commonly. This is followed by a latent period (primary incubation) while the bacillus is establishing itself within the lymphatic circulation. After an interval, not very certainly defined (perhaps three or four weeks), objective evidence may be found (clinical or postmortem) in glandular enlargement which may be either isolated or spreading. At this state the process may be, or at least may appear to be, arrested.

"Later, with wider extension throughout the lymphatic system, all kinds of incidents may occur —for example, extension of infection through propinquity, rupture into some passage, sac, or viscus (or there may be local exudation)—any of these giving rise to obvious chemical effects. Finally, with the passage of bacilli into the blood stream, whether by the natural channel or more abruptly, as by entrance from a caseating focus, or in the course of surgical operation, the final catastrophe of miliary spread is made possible. The points in time at which such incidents occur or in which reactivation of an existing focus takes place, vary greatly according to the resistance offered by the infected individual. . . . The irregular occurrence of reactivation or extensions is usually registerable by clinical signs and symptoms. . . .

"In no subject in medicine is it more desirable to maintain the biological outlook. Once the tubercle bacillus has gained a foothold, the possibilities resulting from bacillary implantations are manifold, and should be kept in mind by the thoughtful physician without fuss or exaggeration."

This impressed me as a basis upon which a conception of cutaneous tuberculosis might be developed. Too long have we as dermatologists looked upon tuberculodermas as isolated skin diseases. In neither syphilis nor leprosy is the morphology or classification of a skin lesion given undue attention, but in tuberculosis because the internal process is hidden, attention has been centered upon the cutaneous lesion and the internal source is ignored. The individual's protective power and the natural history of the disease have been lost sight of. We have been considering a tuberculous lesion and not tuberculous disease.

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[*] Prepared especially for the Dermatology issue of The Journal-Lancet.

[†] From the Division of Dermatology, University of Minnesota, Henry E. Michelson, director.

As Krause[2] aptly puts it: "Human beings pass as perfectly well as long as they hold their tuberculous infection asymptomatic, inactive. But they are allergic. And any discharge of sufficient focal material to a new place will render them immediately ill because of the allergic reaction that ensues promptly." This view explains adequately the recurrence of labile forms of cutaneous tuberculosis, such as the tuberculides; and the disappearance or "curing" of the lesions does not mean an eradication of the tuberculous disease, only a state of skin immunity.

It is well known that cutaneous involvement is much more common in the early years of life than it is after puberty. No edequate explanation for this fact has been offered, but the disposition of the skin in these years must be more receptive to the parasite which, when it locates in the connective tissues, finds itself in surroundings harmonious to its growth. Since the exposed parts are invaded so much more often than the protected skin, external factors must also play a part, and too, the female is infected more frequently than the male, so that we must use moderation in making sweeping statements about the favorable conditions for development of skin tuberculosis.

Primary infection of the skin is a comparatively rare occurrence, so that for practical purposes, almost all of the lesions may be looked upon as being of a secondary nature.

In my opinion all cutaneous tuberculosis of the skin, with very few exceptions, is merely an external manifestation of an internal infection. In our own observations, especially in sanitaria where the most expert facilities are available, and where physicians are adept at demonstrating internal lesions, *almost without exception* either active or inactive internal lesions have been found. My plea to dermatologists is, therefore, to view tuberculodermas merely as an external manifestation of a systemic infection and their morphological characteristics as an index to the degree of cutaneous allergy possessed by the host or to some inherent tendency on the part of the individual skin.

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1. Philip, Sir Pobert: B. J. M., June 23, 1934, p. 3833, "Musings in the Garden."
2. Krause.

WASSERMANN FASTNESS*

PAUL A. O'LEARY, M.D.†
ROCHESTER, MINN.

THE persistence of a positive Wassermann or flocculation test of the blood relative to an individual who has syphilis is invariably of considerable concern both to patient and physician. The number of inquiries received orally and by letter indicate that failure to obtain a negative test following intensive treatment is one of the most common and irksome problems encountered by the physician who treats syphilis as part of his general practice. By common usage the term "Wassermann fastness" has crept into the medical vocabulary, unfortunately to such an extent that it is sometimes considered a clinical diagnosis instead of a laboratory finding. This expression has grown in wideness of use as the result of the increasing number of patients who have been adequately treated, some for long periods of time, without the degree of positivity of the Wassermann test or of the flocculation test of the blood being materially influenced.

At this point I should like to digress for a moment to comment on the recommendation made by the Committee on Serology,[1] to the effect that the reporting of serologic tests by a minus sign or by one, two, three, or four plus signs be abandoned and that in their places the terms "negative," "weakly positive," and "positive" be substituted. The basis for this recommendation is the fact that the degree of positivity is of no significance in the interpretation of the activity of the infection; the difference between a two plus or a three plus report is actually a manifestation of the personal equation which enters into the serologist's interpretation of the test rather than of the degree of variation in the state of the syphilis.

Mention has been made that the expression "Wassermann fastness" is considered a diagnosis by some syphilotherapists. The purpose of this communication is to call attention to the reasons why use of the term in this manner is unwarranted and why a complete syphilologic survey of the patient is necessary to adequate understanding of the irreversible positive Wassermann or flocculation test of the blood. Also, it is pertinent to the question to know, in the appraisal of the patient's serologic status, the amount and type of treatment he has received during various phases of the disease. This is particularly significant if syphilis has been but recently acquired, but it becomes less important, in comparison to the patient's clinical findings, as the disease grows older. Accordingly, the result of the clinical examination, the status of the spinal fluid, the amount and type of treatment received previously, and the duration of the infection are the factors which are necessary to adequate appraisal of Wassermann fastness. The interpretation of these factors in association with persistently positive serologic tests of the blood will be considered according to the various phases of syphilis.

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*Prepared especially for the Dermatology issue of THE JOURNAL-LANCET.

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Early Syphilis

In patients with early syphilis a persistently positive Wassermann test of the blood is encountered (1) in cases of early syphilis in which treatment has been inadequate, (2) in cases in which the patient is a "chronic relapser," who has recurrent lesions of the mucous membrane and skin, (3) in the presence of a positive spinal fluid, and (4) in cases in which visceral syphilis has developed as a complication of the early syphilis, in the form of hepatic disease, cardiovascular disease, and the like. It is difficult to state the exact amount of treatment which may be termed "adequate" in an individual case of acute syphilis. Likewise, it is impossible to forecast, concerning the patient in the same case, the amount of treatment which will assure him of a permanently negative blood test. In some cases the serologic tests of the blood will remain negative after a few injections of arsphenamine, while in others fifty or more injections of arsphenamine and twice as many injections of bismuth or mercury are necessary to produce such serologic negativity. However, it has been found in the studies made by the Coöperative Clinic Group[2] that the majority of patients who have acute syphilis require as a minimum thirty injections of arsphenamine and sixty injections of one of the heavy metals to produce serologic negativity of the blood. Hence, it is advisable to start the treatment of a patient who has acute syphilis by outlining a program in which the amount of therapy is planned. During the course it is necessary to observe him not only for clinical signs of recurrence but to follow the progress of the serologic reactions of the blood also. If the serologic reaction of the blood reverses to negative early in the course, and remains negative, the problem is simple. On the other hand, if the Wassermann or flocculation test of the blood becomes negative, only to become positive again within a short time, while treatment is being administered, search must be made to elicit the cause of such reversal. The most likely causes of such reversals are that the patient is a so-called "chronic relapser" or that the spinal fluid has become positive. It is less likely that visceral syphilis has developed in the form of aortitis, periostitis, or hepatitis. If the clinical search reveals that one of the afore-mentioned factors is present, it is indicative of one or more of the following situations: that the treatment given thus far has been insufficient; that the intervals between the courses of treatment have been too long; that the dosage of arsphenamine and heavy metal has been too small; that the treatment has been irregularly or unsystematically given, or that the patient belongs in the small group of those who fail to develop resistance to the disease.

It has been shown that continuous treatment, given so that the patient who has acute syphilis receives the minimal number of injections of arsphenamine (thirty) and of bismuth or mercury (sixty) within sixteen months, results in cure in 86 per cent of the cases. Accordingly, if serologic reversal of the blood is not obtained with this amount of treatment and no obvious explanation is at hand, it may be advisable to give this patient several more courses of arsphenamine and of a heavy metal if satisfactory serologic change is to be noted. If the patient has been indifferent about the treatment and has permitted intervals of several months to elapse between courses of treatment, or in other words if he has failed to follow the program of treatment as outlined, the likelihood is that he will give a persistently positive Wassermann test of the blood, complicated by one or more of the clinically recognizable causes for it. Not only is sufficient treatment necessary but regularity in its administration is essential to a successful serologic and clinical outcome. It has likewise been shown that patients who receive small doses of arsphenamine, for example, 0.3 gm. or less of old arsphenamine, or 0.5 gm. or less of neoarsphenamine, are more prone to Wassermann fastness than are those who receive larger doses. At the same time it is to be borne in mind that complications of treatment, in the form of dermatitis, neuritis, jaundice and so forth, are more numerous among those who receive the larger doses. The factor of resistance, its presence or its absence, cannot be estimated in the present state of knowledge, until, in the individual case, the physician has had the opportunity to observe the patient's reaction and response to treatment over a period of years.

The patient who, during treatment for acute syphilis, manifests a positive spinal fluid test, which is not reversed to negative by continuation of the treatment for a reasonable time, is a candidate for intensification of treatment or for a change from the specific to the non-specific forms of therapy. Intraspinal medication or fever therapy may solve the problem in such a case. In the case in which clinical signs of visceral disease develop, or severe periostitis appears, or recurring infectious lesions of the mouth or genitalia continue to develop, help may be given by changing the type of arsphenamine. That is, old arsphenamine may be used in place of neoarsphenamine, or a soluble salt of mercury succinimide may be employed in doses of 1/6 grain (0.01 gm.) daily for forty to fifty injections in place of an inadequate insoluble mercury or an ineffectual bismuth remedy. The ability to change from one remedy to another when thorough trial has demonstrated that the first one employed is inefficient is one of the earmarks of a capable syphilotherapist.

Latent Syphilis

Wassermann fastness is also frequently encountered in cases of latent syphilis, that phase of the disease in which clinical signs of the disease are not present and in which the spinal fluid is negative. The diagnosis of latent syphilis is possible only if patients have had the disease four years or more and if signs of syphilitic aortitis or if other manifestations of the disease referable to the visceral or central nervous system, are missing. Although latency is one of the phases of syphilis which the physician endeavors to produce, it is unfortunate that in all cases in which this state develops the patients do not maintain it. This is well demonstrated in the case in which latent syphilis develops and in which the infection remains dormant for ten or more years but at the end of this time aortitis or some equally serious form of the disease is found. It is for this reason that the treatment of Wassermann fastness in cases of latent syphilis cannot be systematized. Each of these patients presents a therapeutic problem of his own, and the decision as to the subsequent program of treatment is influenced by the patient's age, the amount of treatment previously received, the result of physical examination, and the duration of the syphilis. In a recent communication[3] I elaborated on the various principles employed in the treatment of latency in its various manifestations. These may be enumerated briefly as follows: If a woman thirty years of age or thereabouts has had syphilis for ten or more years, usually it is advisable to continue treatment with a series of injections of bismuth. Two courses of bismuth a year, fifteen or twenty injections to the course, for a period of three years should be given in conjunction with annual physical examinations to detect objective signs of syphilis. If during or after this treatment the woman should become pregnant. a complete series of courses of arsphenamine and heavy metal should be given, because the amount of treatment received previous to the beginning of the pregnancy does not give assurance that the child will be free of syphilis. If the patient is a middle aged man or woman whose blood gives a positive Wassermann test, and if the syphilis is of twenty or more years' duration, moreover, if there are no clinical signs of syphilis and the spinal fluid is negative, the same sort of bismuth therapy may be given, or the patient may be placed on "parole," to undergo annual observations and physical examinations. The factors which control the decision as to which course to pursue are (1) the amount and type of the previous treatment given, both that administered for the early syphilis and that given during latency; (2) the duration of the infection, which is significant when it is borne in mind that the great bulk of the serious complications appear between the twelfth and eighteenth years of the disease, and (3) the patient's attitude toward the infection. This last is a potent factor and is demonstrated by the patient's desire to appear for annual reëxaminations or by an indifference which results in a lack of coöperation in this respect.

If patients are elderly, have had syphilis for thirty-five years or more and have nothing to show for their infection but a persistently positive Wassermann test of the blood, the need for additional treatment is decidedly minimized and accordingly usually is not necessary. These patients have controlled the infection for many years and probably will live their normal span of life, to die with the Wassermann or flocculation test of the blood still positive and no gross manifestations of syphilis. It is to be reëmphasized that the ability to determine visceral syphilis is necessary to the successful management of these patients.

Late Syphilis

In late syphilis the problem of Wassermann fastness is quite different from that presented by early or latent syphilis. The majority of the late manifestations of visceral syphilis are accompanied by a positive serologic test of the blood, which tends to remain positive even after treatment. Until recently it has been the aim of most syphilotherapists to direct treatment to the point of reversing the serologic tests of the blood to negative, whereas now the tendency is to direct and maintain treatment so that the patient remains well, or until the complication is under control. The extension of the expectancy of life of these patients should be the aim of therapy and not the reversal to negative of the Wassermann test of the blood. Although experience justifies use of the term "cure" in speaking of early syphilis, the idea of cure in regard to latent syphilis is less warranted. while in late syphilis cure is unlikely. However, "arrest" of the late manifestations of the disease may be anticipated in certain of these cases. Approximately 20 per cent of the patients who have cardiovascular syphilis give negative Wassermann or flocculation tests of the blood, irrespective of the amount of treatment received. Of those cases in which these tests are positive, in less than half are they reversed to negative by treatment, and if the heart is in a state of good compensation the status of the serologic reaction is not significant. It is much more important that effort be made to maintain the compensation than to change the blood tests to negative.

In the treatment of neurosyphilis the same principle is applicable as far as the reports on the blood are concerned but not when the spinal fluid findings are considered. The positive blood test is of significance in this phase of syphilis for it tends to reflect the reaction of the spinal fluid, and when the fluid becomes negative under treatment a positive blood test is a warning sign that the spinal fluid should be reëxamined at intervals of six months to a year, to note whether or not the reaction of the fluid has relapsed. With reversal of both the blood and spinal fluid to negative, the persistence of negative blood tests, especially of the flocculation test, implies that the spinal fluid is also remaining negative.

The presence of Wassermann fastness in the less serious types of syphilis, such as osteitis, gumma of the tongue, gastric syphilis, and so forth, may need prolonged treatment to reverse the serologic reaction of the blood after the active lesions have undergone involution, but even in these cases search for evidence of involvement of the central nervous system or of disease of the viscera is necessary in an effort to explain the positivity of the Wassermann test of the blood.

Comment

The significance of Wassermann fastness varies; it may be meaningless, as it is in the case of the asymptomatic patient who has syphilis of forty or fifty years' duration, or it may be evidence of the presence of a mild or a malignant form of the disease. In order to interpret the meaning of Wassermann fastness the patient must be thoroughly surveyed clinically and the spinal fluid must be examined. The success with which examinations of this sort reveal objective signs of the disease is variable and is dependent on the physician's threshhold of suspicion for the early earmarks of clinical syphilis.

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SCABIES*

Further Observations on Its Treatment with Pyrethrum Ointment

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SCABIES is an extremely common and annoying skin disease and its diagnosis is not always easy as Stokes[1] has pointed out in a recent article. The principal points in diagnosis are the location of the eruption, the finding of the burrow, and the symptoms of itching on going to bed.

Scabies is essentially a front-sided disease and the anterior surface of the body is mostly involved with the back free with the exception of the buttocks. The finding of a typical burrow is not always easy. The wrists, web of the fingers and auxiliary spaces show them most frequently. In cleanly patients the burrow is often very hard to find and in some obscure cases a diagnosis may be made only tentatively from the history of other cases in the family or itching at night.

Scabetic lesions in babies and sometimes in women may resemble an urticarial wheal, but differing from urticaria in that the lesion is not evanescent but persistent. These wheal-like lesions can also occur on the genitalia. In neglected cases a secondary pus infection often occurs and it is important to consider a diagnosis of Scabies in all cases of pyoderma of the hands, especially if the lesions are in the finger webs or on the palm.

The treatment of Scabies in the Minneapolis General Hospital Clinic for many years has been Wilkinson's ointment. In nearly every case it was necessary to give treatment for a post scabetic dermatitis. Wilkinson's ointment is also dirty and smelly, so we were glad to try Pyrethrum when it was offered.

A preliminary report of our results in the treatment of 618 cases has been made[2] and for the benefit of those who may not have read this paper the liberty is taken here to repeat what was said concerning the pharmacology of pyrethrum.

Pyrethrum flowers having insecticidal value are obtained chiefly from Pyrethrum cinerariaefolium (Chrysanthemum cinerariaefolium) and other species of pyrethrum which are grown on a commercial scale in Japan and Dalmatia. The insecticidal properties of pyrethrum flowers are due to two active principles, known as Pyrethrin I and Pyrethrin II, which are present in a good grade of flowers to the extent of 0.9 per cent.

Chemically, these pyrethrines are esters of the ketone-alcohol pyrethrolone with two acids, chrysanthemum monocarboxylic acid and chrysanthemum dicarboxylic acid methyl ester. It is difficult to extract the active principles in a pure state and there seems to be no advantage in purifying them, for it is possible that the presence of oily, resinous, and waxy substances makes for a better preparation. The ointment consists of an absorbent fatty base in which is dissolved the extractive matter of pyrethrum flowers. It contains 0.75 per cent pyrethrines, hence, 100 gm. of the ointment used in this investigation represents 83 gm. of pyrethrum flowers.

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We believe that an ointment of this strength need not have exfoliative qualities for it apparently readily penetrates the burrows and kills the eggs without the dangers of exfoliation.

Method of Use

Scabetic patients are handed a printed slip with directions for use of the ointment.

First night, take a warm soapy bath for at least twenty minutes, scrubbing vigorously, preferably with a brush. Dry with rough towel and apply the ointment to the entire body from the neck to the feet. Use the ointment every night for from five to seven days, then take the second bath and report to clinic. Change clothing and bed clothes at beginning and end of treatment.

In series II we treated 595 cases, these, added to the 618 in series I made 1,213 cases in all. The results are shown in the following chart.

	Number of Cases	5-7 Days	7-14 Days	To Wilkinson's
Series I (Previously Reported)	618	517	88	13
Series II	595	361*	195	39**
Total Cases	1213	878	283	52

*5 Days or Less	59 Patients
6-7 Days	93 Patients
Cases Never Returned for Further Observation	209 Patients
	361 Patients

**Severe Pustular Scabies Treated with Wilkinson's	8 Patients
Poor Co-operation	31 Patients
	39 Patients

In Series II, one patient developed a dermatitis due to Pyrethrum after three month's use. The patient used the ointment for one week without any signs of irritation. As the treatment was still incomplete she was given a refill of the ointment and told to return in four days. The patient disappeared from clinical observation for three months, then returned with a dermatitis. Patch tests to Pyrethrum ointment after this long interval were positive. The dermatitis could be explained by a developed sensitivity from prolonged use of Pyrethrum. The patient had been previously treated for Lichen Simplex Chronicus.

* * *

Wilkinson's formula was prescribed in 31 cases following Pyrethrum because of poor co-operation in applying the ointment on repeated reinfection between members of the same family. In eight additional cases, Wilkinson's was substituted because of severe pustular scabies.

In a series of 1,213 cases of Scabies treated with Pyrethrum ointment, 878 required from five to seven days, and 283 took from seven to fourteen days to complete the treatment. It was necessary to go over to the use of Wilkinson's ointment in 52 cases—either on account of pustular involvement or poor co-operation.

In the first series only four cases were found sensitive to the ointment and in the second series only one case showed sensitivity. This is in marked contrast to the results following the use of Wilkinson's ointment where nearly all patients showed dermatitis in some degree and many patients needed treatment for the dermatitis for two or three weeks.

Summary

Pyrethrum ointment offers a clean, effective and valuable remedy for the treatment of patients with Scabies. Its use is not recommended in pustular scabies. The preliminary scrubbing and bath is most important and the success or failure of the treatment depends largely upon how thoroughly it is done, as if well done, the burrows are opened and the parasites and eggs killed.

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ULCERS OF THE LEGS: DIAGNOSIS AND TREATMENT*

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ONE of the common problems of general medical practice is the management of cases of ulcer of the leg. By far the most important type of ulcer and the one which comes first to mind is that which is associated with varicose veins. This is situated chiefly about the ankles of obese women who have had several children and who are actively engaged in the cares of a household; proper medical treatment is often postponed because the time cannot be spared or the money spent for the necessary care. Any failures in treatment of chronic ulcer of the leg may be attributed to the fact that when varicose veins are present secondary causes are often overlooked on the assumption that the element of stasis accounts for the entire syndrome. Before varicose veins and ulcers are considered further, I shall take up some of the other types of ulcers which frequently affect the legs and which must be considered in the differential diagnosis.

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Gummas, periostitis and nodulo-ulcerative lesions of syphilis occur by predilection over the anterior surface of the tibia at the middle third. Usually one leg only is affected by the chronic, indolent process which assumes more or less the characteristic configuration of a tertiary syphilid. For a diagnosis of syphilis the history of primary or secondary lesions is secondary in importance to the information gained from inspection of the lesion, the general physical examination for other signs of the disease, or from reports of laboratory tests on the blood and spinal fluid for syphilis. In order to bring about a permanent cure of the lesion, specific treatment for syphilis may need to be reinforced by use of supportive measures for the leg. Examples of typical tertiary syphilis of this type are found less frequently with each succeeding year. The increasing acuity of diagnostic methods and the added emphasis which has been placed on the study of this subject in the better medical schools throughout the world probably accounts for this.

Tuberculosis of the skin of the legs appears usually as an indurative form of disseminated tuberculosis on the posterior aspect of the lower part of the calves, and is spoken of as erythema induratum of Bazin. It is found most commonly in young, slightly obese women who are in the early twenties and is characterized by relapses and remissions. The skin of all the extremities often is mottled and blue. This color change increases in cold weather. The lesions on the calves appear first as subcutaneous nodules which coalesce and ulcerate, with considerable undermining and the formation of numerous sinuses (Fig. 1). The histopathologic picture is typical of tuberculosis. Careful inspection may reveal the presence of other types of tuberculids on the toes, fingers, or about the head; such a finding will help to verify the diagnosis. The most important item in treatment is attention to measures which will improve the general health of the patient, but in spite of a most exacting regimen the condition is likely to cause great disability for a long period.

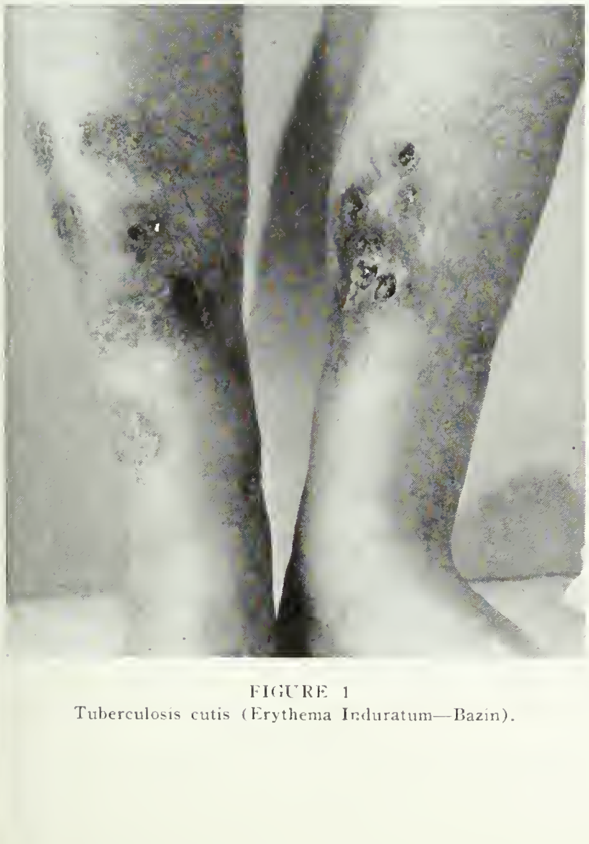

FIGURE 1
Tuberculosis cutis (Erythema Induratum—Bazin).

Pyogenic infections of the legs frequently give rise to persistent ulcers which do not yield readily to treatment. Primary inoculations may be at the site of an insect bite or the result of trauma or fracture of a bone in which healing is delayed. In rare cases extensive, boggy, undermining ulcerations are associated with systemic disease, particularly chronic ulcerative colitis. This condition is known as pyoderma gangrenosa. The ulcers of blastomycosis sometimes affect the legs and they may be recognized by the miliary abscesses which make up the borders; careful microscopic examination of the pus from these abscesses will reveal the budding, doubly-refractile organisms.

A rather unusual type of ulcer appears on the legs of certain nervous women who have used bromides for relief of persistent headaches. In certain cases large pustules occur about the face and extremities; these pustules coalesce with subsequent softening and ulceration. The border of such an ulcer is soft, boggy and undermined and in the advancing margin there is usually a zone of erythema which fades into the surrounding skin. The center of the ulcer and the base sooner or later becomes verrucous and so assume the hypertrophic appearance of late bromoderma. A large dose of bromide is not necessary to bring about such a reaction provided the patient is sufficiently sensitized. Furthermore, when once the eruption is established, only a very small amount of the particular drug at long intervals may be required to maintain the process. Bromides are excreted slowly but their excretion can be facilitated somewhat by the oral or intravenous administration of large doses of sodium chloride.

In the past few years members of the Section on Dermatology of the clinic have observed an increasing number of ulcers about the legs, as well as elsewhere on the body, which have been the result of a too enthusiastic treatment with radium or roentgen rays of some banal dermatosis. The earliest sign of disturbance is an actinodermatitis which may appear months or even years after the treatment was given. Many times these sad sequelae are the result of several small doses which have been given over a long period. The early signs of actinodermatitis are telangiectasia and pigmentation, and later keratosis appears; epitheliomatous degeneration often follows. As a result of the obliteration of the underlying blood vessels, it is only a matter of time, in the more severe cases, before ulceration of the skin occurs. This is attended with excruciating pain and prolonged disability. In many instances the entire ulcer and the surrounding affected skin must be excised surgically and a complicated procedure of skin grafting must be employed. Sometimes healing can be effected by proper management without grafting over a long period, but there is continual danger of a recurrence following trauma to the affected site.

Other conditions which produce ulcers on the legs must be considered, although they are less common than those which have been mentioned. Ulcers about the feet and ankles may result in abnormal arteriovenous communications of the legs, either congenital or traumatically acquired. Ulcers of hysterical subject may be produced artificially under the pressure of suggestion or through a malingerer's selfish motive. Trophic ulcers appear in cases of tabes dorsalis, syringomyelia and Raynaud's disease. Ischemic ulcers occur following the arterial obliterative processes of senility, diabetes or thrombo-angiitis obliterans. In the last condition ulcerations may appear about the tips of the toes at first and later may spread to involve both lower extremities as a result of interference with circulation. When ulcerative processes on the legs or elsewhere are of long standing, the presence of malignant degeneration must always be kept in mind and treatment must be adapted accordingly.

Treatment

Treatment of ulcer of the leg when such etiologic factors as infection, trauma and underlying circulatory disturbance have been ruled out, consists mainly of measures to eliminate edema, to clear up secondary infection and to stimulate healing of the denuded surface. In the case of varicose ulcers so much has been accomplished in the past few years in the perfection of the technic of the sclerosing of the varices by the injection of chemicals in solution that prolonged disability as the result of varicose veins in themselves has been considerably lessened. Of the various solutions that have been recommended, probably the most satisfactory is a five per cent dilution of freshly prepared sodium morrhuate. If the patient is obese, strict dietary control should be instituted in order to bring the weight nearer normal. In cases in which considerable chronic edema is present, there is no substitute for rest in bed with elevation of the extremity for a time. This reduces the edema and at the same time by means of the application of wet dressings of mild antiseptic substances most of the secondary infection can be eliminated. The skin surrounding the ulcer should be protected by greases from the macerating effect of the wet compresses. Furthermore, to offset a condition of sogginess, during the day periods of drying under the heat of a simple electric light bulb suspended in a cradle over the bed should alternate with periods in which wet dressings are applied. When the ulcer is sufficiently cleansed, dressings of one of the preparations which stimulates formation of granulation tissue and promotes the proliferation of epithelium should be applied, namely thioglycerol (Abbott) in a 1:5,000 dilution, or buffered cysteine hydrochloride (Squibb) in 0.5 per cent solution. Use of such a drug can be alternated with that of mildly stimulating preparations, such as five or ten per cent balsam of Peru or scarlet red in petrolatum. In order to prevent return of edema when the patient becomes ambulatory it is necessary to apply supportive measures to the extremity. Generally the best results are obtained when bandages are applied to the leg from the toes to the knee and the ulcer is protected by a small bit of gauze and an overlying thin section of rubber sponge which is slightly larger than the surface of the ulcer. The least effective of all types of bandage are the fitted elastic stockings. When these are new they are effective but with each successive laundering they lose their symmetrically snug fit and no longer serve the purpose for which they were intended. The old-fashioned Unna cast of gelatin, glycerin, zinc oxide and water is cheap and effective. The newer adhesive-faced, elastic bandage sold as elastoplast is a valuable aid in the treatment of chronic ulcers of the legs. Such a bandage should be applied when the edema has been reduced and it can be replaced every one or two weeks; at each change the ulcer will be found to have healed steadily while bathing in its own juice. In some cases in which edema persists, a stronger webbing is necessary or even a bandage of 50 to 100 per cent para rubber must be employed. In some cases of extensive ulceration skin grafting shortens considerably the time of healing. The technic used consists of transferring multiple pinch grafts to the denuded surface when the granulation tissue is sufficiently healthy. Under proper conditions such grafts will implant themselves satisfactorily within four or five days if the bandage is not disturbed in the interval and is kept slightly moistened. The patient may even be ambulatory provided no edema fluid is allowed to accumulate in the leg.

When the varicose veins have been sufficiently obliterated by injection of chemicals, a light bandage should be worn both to support the circulation and to protect the skin against trauma, and the extremity should be examined periodically for the further appearance of varices so that they can then be treated before disabling sequelae develop.

SKIN BIOPSIES*

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A SKIN biopsy is the removal of a piece of skin for histological examination in order that a clinical diagnosis may be verified or in case of clinical doubt, the diagnosis may be facilitated.

In spite of the fact that the skin is the most easily accessible tissue of the body for biopsy, we rarely hear of a biopsy being taken except in a dermatological clinic or specialist's office. This may be due to several factors. First is the patient's fear of pain and his dread of the subsequent scar. This is readily set aside by the fact that the biopsy is done under local anaesthesia, either ethyl chloride topically or one per cent novocaine subcutaneously. However, skin biopsies taken with a rotating punch, either hand or attached to a dental motor, cause minimal pain and at times require no anaesthetic.

The biopsy is generally taken from a lesion in an area which is covered by clothes. If the face alone is involved, lesions under the angle of the jaw lend themselves best to biopsy. A punch biopsy which need not be larger than three or four millimeters, heals with scarcely any scar at all, and leaves only a slight superficial dimple. Rarely are larger biopsies necessary, and in that case eliptical excision is done and the edges brought together with fine dermol sutures. In the latter case, anaesthesia with novocaine is always necessary as the resultant wound must be carefully repaired and the edges closely approximated.

In the removal of the biopsy, care must be taken to get the entire thickness of the skin. This is always certain if the specimen, after it is cut free of its edges, is seen to hang delicately on the subcutaneous fat. A portion of this fat is allowed to remain attached to the specimen as it is snipped from its base.

The specimen is placed either in 10 per cent aqueous formalin or 70 per cent solution of alcohol. Formalin is the preferred fixative if the lesion appears to be of a lipoid nature, as a stain for fat can be done much more easily on tissue thus fixed. Otherwise, the type of fixative is of no great difference. The specimen, together with a clinical description is sent to a skin pathologist. The clinical description consists of the following points: 1. Location of the lesion biopsied; 2. number of lesions and their location on the body; 3. duration of the eruption; 4. the clinical description of the typical lesion. In addition, any other findings as tuberculin reaction, Wassermann reaction, urinary findings, and blood picture may be of some assistance and should be included. Also of value is the physician's clinical impression of the possible diagnoses. All of these facts must be given to the dermatopathologist. Without them he can only give the general pathologist's diagnosis of chronic inflammation or can list two or three diseases which may coincide with the histological picture. These facts are important because skin in different areas varies in thickness as a whole and also in its individual layers, so that what may be normal for one location is pathologic for another. There are, however, several skin conditions having a specific microscopic picture, but the clinical findings aid the skin pathologist in arriving at a correct diagnosis.

The frequency of skin biopsies in our clinic is about one for every fifteen new patients. We find biopsies useful in verifying our clinical diagnosis and at times in reaching a diagnosis. Thus, in our clinic, we have seen patients diagnosed syphilis clinically, when histologically the diagnosis was parapsoriasis. In a more recent patient a clinical diagnosis of malignant melanoma of the foot was proven to be a fibroxanthoma with hemorrhage on histologic study. In another clinic a skin eruption was diagnosed and treated as syphilis, but failing to respond to therapy a biopsy was taken and a diagnosis of urticaria pigmentosa was made.

Likewise, tumors and new growths of the skin can only be diagnosed with certainty on histologic study. We do not consider skin cancer any contraindication but rather an indication for biopsy. Many times the benign basal cell epithelioma on clinical examination is microscopically a mixed cell or squamous cell carcinoma. Not infrequently, the squamous cell carcinoma clinically, is microscopically a degenerated papilloma. We are able through this means to estimate both the type of therapy of choice as well as the amount of radiation of roentgen rays which are to be used.

Conclusions

1. Skin biopsies are easily done; pain to the patient is minimal; and resulting deformity is negligible.
2. Skin biopsies aid clinical diagnoses and differentiate diseases of a similar clinical picture.
3. The clinician must always give the skin pathologist a description of the cardinal clinical features.
4. Malignancy is no contraindication for biopsy of skin lesions but rather a justifiable aid to proper treatment.

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CANCER OF THE FACE*

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Cutaneous malignancy can be successfully treated either surgically or by a number of physical agents in the majority of instances. Each cancer of the skin requires individualization since one can so frequently arrive at the same result by one or a combination of several methods. The well trained therapist should not be overly enthusiastic for one method and should be prepared to use the agent best suited for each case. He should in general use that method at which he is most adept, keeping constantly in mind that the first attack on cancer is usually the most effective and for this reason should be well chosen and if possible complete so that further treatment will not be necessary. Insufficient treatment, whether it be surgical, roentgenologic or otherwise, is to be heartily condemned.

It is not the purpose of this paper to consider the relative merits of any single method of treating malignancy of the skin, but rather to present a therapeutic analysis of 63 selected cases of cancer of the skin of the face which were treated primarily by irradiation (radium, X-rays or both) at the Cancer Institute of the University of Minnesota. The cases were selected on the following premises: (1) all were uncomplicated at the beginning of treatment, in that structures underlying the skin, such as bone, cartilage, lymph nodes, etc., were not involved either by extension or metastasis. (2) cases previously treated elsewhere by any method were not considered and (3) biopsy was done in all instances. Cases which failed to respond to irradiation were classified as failures even though the patient was apparently cured by subsequent therapy such as surgical excision or destruction of the lesion by electrodesiccation, coagulation or actual cautery. The result of irradiation therapy was considered as satisfactory when the patient had been followed one year without recurrence after completion of the treatment.

At the Cancer Institute irradiation therapy of uncomplicated cutaneous malignancy is applied chiefly in two ways:

In the majority of cases unfiltered X-rays (100 K. V.) are administered to the lesion in dosages from 2,700 to 3,400 roentgen-units at one time, attempting to include approximately 1 cm. of apparently normal tissue about the growth. In general, larger doses are given to baso-squamous and squamous cell carcinomas. Occasionally, lesions which do not respond to these measures are treated again after 8 to 12 weeks. Only rarely is further irradiation given to areas treated in this manner although in some instances in which the lesion spreads peripherally to integument which has not been previously irradiated, more roentgen therapy is administered. High voltage therapy (200 K. V.) is rarely used in uncomplicated cancer of the skin although in a few cases 1 or 2 mm. of aluminum are utilized for filtration in the treatment with low voltage X-rays (100 K. V.).

In large ulcerated carcinomas and in proliferative, thick lesions X-rays are frequently supplemented by the implanatation of radium emanation in the form of gold seeds containing, as a rule, about 1 millicurie of the gas. These implants, which yield 132 millicurie hours of "activity," are implanted through the normal skin at the periphery of the tumor and spaced approximately 1 cm. apart. The implants are not placed within the tumor mass but at a distance from the growth equivalent to that which would be allowed were the lesion being surgically excised.

For the sake of brevity the analysis of the cases is given in the following tables which are self explanatory:

TABLE I
LOCATION OF LESIONS

	No. of Cases
Forehead	2
Ear	3
Temple	4
Nose	24
Eyelids and Canthi	16
Cheeks	14
Total	63

TABLE II
AGES OF PATIENTS

	No. of Patients
Below 40	3 (30, 32, 35)
40 to 50	4
50 to 60	15
60 to 70	15
70 to 80	23
Above 80	3 (85, 86, 91)

TABLE III
SEX OF PATIENTS

Male	36 (57%)
Female	27 (43%)

TABLE IV
HISTOLOGIC TYPES

	Basal	Baso-Squamous	Squamous
Forehead	1	..	1
Ear	2	..	1
Eyelids and Canthi	15	1	..
Temples	2	1	1
Nose	10	8	6
Cheeks	8	..	6
Total	38 (60%)	10 (16%)	15 (24%)

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*Prepared especially for the Dermatology issue of The Journal-Lancet.

*From the Division of Dermatology, H. E. Michelson, M.D., Director; and the Cancer Institute, University of Minnesota.

TABLE V
RESULTS OF THERAPY

Location	No. of Cases	1st Treatment (Irradiation Satisfactory)	Re-treated Satisfactorily With Irradiation	Failure of Irradiation
Forehead	2	1	1	..
Ear	3	..	3	..
Eyelids and Canthi	16	13	2	1 (A)
Temple	4	2	2	..
Nose	24	14	7	3 (B, C, D)
Cheeks	14	10	3	1 (E)
Total	63	40 (63%)	18 (29%)	5 (8%)

TABLE VI
FAILURES

	Age	Sex	Histologic Type	Location	Other Therapy	Outcome
A.	40	M	Basal.	Left lower eyelid margin.	X-ray therapy December 30, 1933, and February 14, 1934. Radium April 5, 1934.	Lesion later excised with cutting current December, 1934. Apparently well for 15 months.
B.	91	F	Squamous.	Nose.	X-rays and radium to nose three times from April 15, 1932, to August 22, 1935.	Repeated local recurrences. Present whereabouts unknown.
C.	56	M	Baso-squamous.	Nose.	Irradiated 1929. Local recurrence.	Lesion excised and patient remained well.
D.	73	M	Baso-squamous.	Nose.	Treated with X-rays on four occasions.	Repeated local recurrence. Lesion surgically excised. No recurrence when last seen.
E.	58	F	Squamous.	Cheek.	Treated on several occasions with X-rays and radium.	When last seen, lesion still active.

Summary

1. In uncomplicated cutaneous malignancy of the face irradiation is an effective form of therapy.

2. In 63 such cases treated by irradiation at the Cancer Institute of the University of Minnesota 58 (92 per cent) satisfactory results were obtained (freedom from recurrence for one year after completion of treatment).

3. In five cases (8 per cent), surgical or electro-therapeutic measures were subsequently necessary since irradiation in the dosages previously outlined failed to control the lesion.

PIGMENTATION OF THE SKIN:

Its Value Especially in the Diagnosis of Systemic Disease*

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I WISH to emphasize the practical value of analysis of pigmentation of the skin in the diagnosis of certain systemic diseases, especially those in which generalized cutaneous pigmentation is associated. Differentiation of various types of generalized pigmentation of the skin including those resulting from external factors and certain dermatoses, will be given. Pigmented nevi of various types and new growths will not be considered.

Increased pigmentation of the skin, either local or general, may be attributable to one of the following factors: (1) increased amount of melanin, (2) deposits of various heavy metals, (3) deposits of extraneous pigments, and (4) vascular disturbances. Sometimes all four factors are involved in a given case. The color of the skin is affected chiefly by vascularity and by the thickness of the epidermis, and may be entirely independent of the amount of melanin in the skin. Increased pigmentation with melanin may be merely a racial characteristic. This is important to remember; thus, accentuation of normal pigmentation in individuals of some races may be mistaken for Addison's disease. It is possible to describe only a few of the various pigmentary disorders,[1, 2] and emphasize those in which a specimen of skin for histopathologic study is often of definite value in diagnosis.

Generalized Pigmentation

Addison's Disease—Addison's disease is usually, but not invariably associated with generalized pigmentation of the skin. The disease is also characterized by a low value for the systolic blood pressure and progressive asthenia with fatal termination. The pigmentation of the Addisonian syndrome results from a disease of the suprarenal glands or may arise secondarily to neoplasms of the viscera with pressure or direct invasion of the celiac plexus. The hyperpigmentation of the skin is attributable to melanin which occurs essentially at the sites where pigmentation is ordinarily increased, such as the flexural folds, the axillae, the groin, the perineum, the umbilicus, and underneath the breasts. In cases of marked involvement these areas may become almost black. There usually is hyperpigmentation of the mucous membrane of the mouth, the vagina, and also of the areola of the nipple. The hands and face and areas of the skin exposed to friction, such as the belt line, also will show increased pigmentation. The histopathologic picture simply shows an increased deposit of melanin in the basal cells of the epidermis and capping of the nuclei with pigment; the chromatophores in the cutis are laden with pigment. The skin otherwise remains essentially unaltered.

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Acanthosis Nigricans—Acanthosis nigricans is a rare disease of the skin which may be divided into the juvenile and adult types.[3] The latter in the majority of cases is associated with malignancy, the former usually running a benign course. The adult type is usually associated with a primary or metastatic neoplasm of the viscera which terminates fatally. Symptoms of asthenia and a low value for the systolic blood pressure are not uncommon findings in acanthosis nigricans, especially in the adult type. The distribution of the pigmentation in both types simulates that of Addison's disease. In addition, however, there is accentuation of the normal skin markings, hyperkeratosis, and verrucous and papillomatous lesions develop in the areas of pigmentation. These definitely permit the condition to be distinguished from Addison's disease by the clinical appearance alone. Furthermore, the histopathologic picture, which is the same in both juvenile and adult forms, shows changes in the epidermis that are diagnostic. There is an increased thickness of the corneal layer and irregular proliferation of the prickle cell layer, with adjacent areas of atrophy and dense deposits of melanin in the basal and dendritic cells of the epidermis and in the chromatophores in the cutis.

Hemochromatosis—Hemochromatosis, or so-called "bronze diabetes," is usually seen in association with diabetes or disease of the liver, especially cirrhosis. It is characterized by deposits of hemosiderin in the various organs of the body and usually also in the skin. The pigmentation is diffuse and occurs chiefly on exposed surfaces of the body but occasionally also occurs on mucous membranes. The color of the skin seems to be composed of gray, blue and brown. Again, the distribution of pigment simulates that of Addison's disease. In some cases, however, the deposits of hemosiderin in the epidermis or the involvement of suprarenal glands by the disease stimulates an excessive formation of melanin which masks the bluish-gray hue so that in some cases of hemochromatosis it has been mistaken clinically for addisonian pigmentation. Asthenia and low blood pressure also may be encountered in hemochromatosis, therefore, these factors may not be of value in differential diagnosis. Histopathologic demonstration of deposits of varying sized masses of hemosiderin, which are situated about the propria of the sweat glands and at times outline the reticulo-endothelial system of the skin and extend up even into the dendritic cells of the epidermis, permits a definite diagnosis to be made. Specimen for biopsy should not, however, be taken from the legs as even mild varicose dermatitis or purpuric lesions of any sort will also reveal deposits of hemosiderin in the skin.

Arsenical Pigmentation—Pigmentation of the skin caused by the ingestion especially of the pentavalent and inorganic arsenical preparations, such as solution of potassium arsenite (Fowler's solution) or sodium cacodylate, may be very extensive. The skin of the entire body usually presents a characteristic "raindrop" appearance, together with associated keratoses on the palms and soles, which permit diagnosis on clinical grounds alone. The pigmentation is attributable to melanin, although by Osborne's method one can definitely demonstrate crystals of arsenic in a specimen of skin taken for biopsy. The histopathologic picture of arsenical pigmentation is usually characteristic and diagnostic; it shows relative and absolute thickening of the corneal layer of the epidermis, atrophy of the prickle cell layer, pyknosis, karyorrhexis, and palisade-like arrangement of the basal cells of the epidermis which are laden with melanin. There is also dilatation of the superficial capillaries and there are many chromatophores in the cutis.

Argyria—Argyria may result from local applications of preparations of silver to the mucous membranes, ingestion of various silver salts, or from intravenous treatment with silver arsphenamines. Generalized argyrosis usually has a marked grayish hue. As in hemochromatosis, however, there may be increased melanin pigmentation, which tends somewhat to mask the color. However, a specimen of skin stained lightly with methylene blue and examined with darkfield illumination such as is used for the demonstration of spirochetes, will reveal very fine, highly refractile particles of silver deposited especially in the propria of the sweat glands. From my experience, none of the other heavy metals will reveal this uniformly very fine type of metallic deposit in this area, with its marked refractility to darkfield illumination.

A case in which generalized pigmentation of the skin was the result of bismuth but simulated the clinical picture of argyria has just been reported.[4] However, the distribution and character of the metallic deposits in the skin differed from the pathologic picture seen in argyria.

Differential Diagnosis—One must mention other generalized pigmentations of the skin. Ochronosis differs from Addison's disease in that pigment affects the deeper structures. Pathologic studies reveal that melanin is deposited in the cutis and subcutaneous tissues and not in the epidermis. Certain cases of generalized scleroderma[5] which present marked generalized increase in melanin pigmentation (even with asthenia and a low blood pressure), the pigmentation in pellagra, increased pigmentation associated with thyroid and ovarian disturbances, and xeroderma pigmentosum are readily distinguished from Addison's disease by concomitant data. This is also true of residual pigmentation from generalized lichen planus or dermatitis herpetiformis and of the pigmentation resulting from physical agents such as actinic rays, heat, and trauma. I need only mention generalized pigmentation such as that associated with vagabonds' disease or that resulting from occupational dermatitis, including the so-called "war melanosis of Rhiel." Generalized cutaneous pigmentation may be an early or late manifestation of any of the lymphoblastomas of the skin,[6] or may result from toxic pruritus due to internal diseases, including those of the liver and gallbladder. Excoriations of the skin (scratch marks) enable the condition to be distinguished from other cutaneous systemic pigmentations. All these conditions involve an increase in melanin pigment in the skin.

Generalized pigmentation from metals other than arsenic and silver is most unusual.

Carotinemia is characterized by peculiar yellow color of the palms and soles as well as of the skin in general, and can be diagnosed from the clinical appearance alone. In borderline cases it can be distinguished by examination of the blood for carotin. Similar factors apply to sulphemoglobinemia.

Increased pigmentation due to vascular disturbances is seen in stasis dermatitis, polycythemia vera, cutaneous diseases such as Schamberg's progressive pigmentary dystrophy and purpura of all types, or conditions in which bile pigment accumulates in the blood. Again differentiation is dependent on concomitant findings.

Localized Pigmentation

Hollander has given a fairly complete list of localized pigmentations, especially those involving the neck and face.[2] There are a few conditions worthy of mention from the practical point of view. Localized melanosis of the forehead may be the first sign of lymphoblastoma,[7] which should be distinguished from residual pigmentation of hatband dermatitis. An accentuation and increase of existing chloasma and freckles are seen in association with various endocrine disturbances, including pregnancy. Cold cream pigmentation, described by Goeckerman,[8] is not an uncommon occurrence. It is the result of deposits of mercury or bismuth in the skin from the use of certain cold creams containing these ingredients. Clinically, it is characterized by the appearance of a dirty face with increased pigmentation in the grooves of the skin, especially the nasolabial folds. Fixed drug eruptions due especially to the use of phenolphthalein[9] but also to various arsenicals or any of the barbiturates and amidopyrine are characterized usually by fixed oval areas of pigmentation. Following the ingestion of the offending drug, the affected sites become inflamed and even show vesicular and bullous formations. A diffuse and generalized pigmentation of the skin may occasionally be seen following medication, especially with phenolphthalein,[10] as well as those conditions mentioned previously.

Summary

Pigmentation of the skin may frequently offer the clinician a valuable diagnostic clue to many systemic diseases. It is important to examine the skin of the entire body. Histopathologic studies of the skin are often indicated and are of definite aid in arriving at the correct diagnosis. Some of the pigmentations of the skin which are associated with systemic diseases have been discussed and distinguished from one another.

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CONTACT DERMATITIS[*]

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IT IS NOW thirty-two years since Jadassohn[1] introduced the patch test to demonstrate specifically the etiologic factor in the production of dermatitis resulting from actual contact with simple vegetable or mineral substances in the individual's environment. Any extensive use of the patch test as a diagnostic aid in this country and abroad dates, however, mainly from the stimulus given it by Bloch in 1928[2] and 1929.[3]

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The accepted working classification[4,5] as to the place occupied by contact dermatitis among allergic manifestations divides human allergy into two groups: (1) atopic allergy, denoting that form exemplified by asthma, hay fever, and atopic eczema (disseminated neurodermatitis), which are inherited tendencies, and (2) nonatopic allergy, under which heading contact dermatitis is placed. In group 1 it is possible to demonstrate circulating causal substances, called "atopens," by scratch and intradermal testing. The shock organ of atopic eczema lies in the upper cutis (blood vessels). Group 2 is distinguished by no inherited tendencies, and there are no demonstrable antibodies or atopens determined by scratch or intradermal testing. In contact dermatitis the shock tissue lies in the epidermis and the offending substance may be identified by the eczematous response to the patch test. Drug allergy, allergy of infection, foreign protein allergy, and physical allergy have also been placed in this group but need not be discussed here.

Histologically, contact dermatitis cannot be accurately distinguished from the atopic type. The primary efflorescence may, of course, vary from a papular erythema to bullae and denudation. Clinically, the situation of the dermatitis is often helpful, as the sites most frequently involved are the forearms and dorsal surfaces of the hands, exposed portions of the neck and face, including the eyelids, and the lower part of the leg. The dermatitis may be generalized, when it must be distinguished from the other types of exfoliative dermatitis, and any part of the body may be involved, as is demonstrated by the fact that pruritus ani occasionally is found to be due to a contact dermatitis.

In some cases the diagnosis is made only by exclusion, while in others atopic, mycotic, or bacterial factors may combine to obscure the picture. The term "dermatitis venenata" has been in common use to designate conditions caused by the factors just named, but from its meaning (poison dermatitis) its use might better be confined to irritations caused by the primary irritants, such as chemical burns, when allergy does not primarily enter into consideration. The fact that among other conditions, seborrheic dermatitis, disseminated lupus erythematosis, lichen planus, lichen simplex chronicus, and rare entities such as pityriasis rubra pilaris, must at times be differentiated, permanently places contact dermatitis in the field of dermatology rather than in that of allergy. The tremendous importance of occupational dermatitis as a hazard of industry (up to 68 per cent of reported causes of loss of time in industry) has been stressed recently by Foerster. The more careful and exact diagnosis of contact dermatitis will tend to lay the groundwork for intelligent revision of the archaic regulation of state industrial commissions.*

Without doubt the most important factor in the management of contact dermatitis is a carefully taken history. An extra ten or fifteen minutes spent in questioning the patient often saves a tremendous amount of wasted time and effort later. It is often necessary, figuratively, to start with the patient "au naturel" and work outward, considering his toilet articles, clothing, shoes, and so forth, before questioning him concerning his occupational contacts. In dealing with patients who follow certain occupations, commonly irritating substances should be considered first (procaine if the patient is a dentist, and so forth), but it is wise to study the patient first, as an individual, rather than to do a routine series of patch tests. Often hobbies are more significant than the occupation and the patient may help by compiling a list of contacts as he, more accurately than the physician, can determine what he touches at home and at his work.

Since 1929 the technic of the patch test has remained essentially unchanged, and because of its convenience undoubtedly it will be continued as a general routine except when irritation by the materials employed demands certain substitutions. On a piece of adhesive tape 1½ inch square is fixed a one inch square of gutta percha (cellophane, preferably plain transparent, weight 600, may be substituted). The irritant to be tested is applied to a piece of cotton material* slightly more than ¼ inch square, which is centered on the gutta percha and the whole is affixed to the skin. It is essential that the technic be followed exactly. Portions of leaves to be tested should be cut to approximately the size of the cotton square. Volatile substances may be placed in test tubes, the mouths of which may be fixed to the skin with adhesive tape for intervals of five to fifteen minutes. When a few patches are applied the flexor surface of the forearm is preferable, but when larger numbers of patches are necessary, uninvolved areas on the back, trunk, and outer aspect of the thigh may be used. In some cases it is necessary to repeat the test at a site adjacent to the involved area. The patch is left in place for twenty-four hours, but the patient must be carefully instructed to remove any particular one which causes persistent discomfort. The site is observed at the end of twenty-four hours and again at the end of forty-eight hours, and as reactions delayed beyond this period are known to occur, the patient is instructed to report any later appearance of erythema. The reactions are graded 1 to 4, depending on the degree of erythema and vesiculation.

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*Minnesota, for example, recognizes only twenty-three causes of occupational dermatitis.

*Old white broadcloth which has been washed many times, washed linen, or even white blotting paper can be used.

Certain characteristics of contact dermatitis and unusual reactions deserve emphasis. The first and most important is the tendency of contact dermatitis to flare up at points remote from the original site which have not been directly exposed to the irritant. This occurs when the exposure has been severe, prolonged, or repeated. Thus, if a patient has a severe dermatitis it is best to wait until the condition has become less acute before applying patch tests or a severe flare may be produced. It must also be kept in mind that after an individual becomes sensitive to one irritant (monovalence) he may acquire additional sensitivities of the contact type more easily (polyvalence). Therefore, the pertinence of any positive test must be well considered, in view of the history. For example, as has been shown by Brunsting and Anderson, in many cases of seasonal dermatitis caused by ragweed (oil) the patient is also often found sensitive to turpentine and pyrethrum. It has also been observed that certain irritants tend to give positive reactions which must be considered non-specific. The most frequent offender is adhesive tape, in which case the reaction may be one of two distinct types: (1) A distinct erythema, which is only transient, may appear in twenty-four hours; this is most likely to occur if the case is one in which dermographism can be elicited. (2) It is possible, however, that the patient may actually be sensitive to some component (resins, zinc oxide, and so forth) of the adhesive tape, but in this case the reaction is more permanent. In these cases cellophane fixed to the skin with collodion or "duo-adhesive" may be substituted for the usual adhesive tape (Grolnick). Occasionally substances that are irritating to the pilosebaceous orifices will give a mild papulopustular reaction which has no specific (contact) significance. Falsely positive reactions are also seen with other irritants, particularly with the salts of heavy metals. The worst offenders are nickel nitrate, potassium arsenite, potassium iodide, potassium bromide, bichloride of mercury, quinine, resorcinol, and turpentine. A series of observations led us at the clinic to adopt the belief which Steiner has expressed that the reactions to these materials have some significance in the diagnosis of atopy.

The strength of the irritant used in patch testing and the record of control tests on normal individuals are data which, although frequently omitted in reporting new causes of contact dermatitis, are essential parts of the report. An extensive collection of substances recorded as contact irritants, with suggested dilutions, is to be found in a recent book on allergy by Erick Urbach. Unfortunately no such list compiled in this country is available at present. In table 1 is a short list* of substances frequently employed; these have been controlled by many negative patch tests.

When a substance is used for patch testing and reported records of reactions caused by the substance are not available, it should be a general rule to test with a dilution not exceeding one-third of the concentration to which the patient was exposed.

The exact mechanism of the production of contact dermatitis is still obscure. It is generally known that the use of soaps frequently causes a flare of contact dermatitis and often also apparently is a predisposing factor in its production. Burkhardt proposed the idea that normal skin has the ability to neutralize alkali at a certain rate, and when this function is disturbed the skin becomes susceptible to sensitization by other previously innocuous substances.

It is of considerable interest that contact dermatitis can be produced by the oily fraction of plants and pollen, the water soluble fractions of which are instrumental in the production of atopic allergy (hay fever and asthma). Poison ivy and poison oak were thought to be the etiologic factors in several varieties of contact dermatitis until they were proved not to be. As patch testing comes into more general use, many new causes of recurrent seasonal dermatitis will be found and those disgraced plants may be able to regain some semblance of respectability. At The Mayo Clinic we recently saw a gardener's son, twenty-six years of age, who has been treated for dermatitis from poison ivy yearly since childhood, but who, after a series of forty patch tests, which included a test to poison ivy, was found to give a positive reaction only to the leaf of bachelor button.

The treatment of contact dermatitis is primarily to avoid the irritant but, if contact with it occurs, to use wet dressings and soothing ointments. No effective means of hyposensitization therapy has been devised as yet, except in those cases in which the dermatitis is attributable to the plant oils and even then its value is debatable. Not infrequently the patient should change his occupation or move to a different climate.

Contact dermatitis is that division of allergy which permits of the highest degree of accuracy in diagnosis. The criteria for diagnosis might be summarized as follows: (1) the presence of definite eczematous changes on the skin (also characteristic histologic changes); (2) history of exposure or proved possibility of exposure in the patient's environment; (3) improvement of the condition on withdrawal of the irritant;

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*An exhaustive list, with a review of the literature to date, is in preparation and will be the subject of a later publication.

(4) recurrence of the dermatitis on re-exposure to the irritant; (5) the demonstration of eczematous change at a normal site when the suspected substance, in a dilution not irritating to the skin, is applied (positive patch test).

TABLE 1

A PARTIAL LIST OF IRRITANTS AND HOW TO APPLY THEM IN PATCH TESTING

Material	*Dilution*	*Vehicle*
Ammonia	2%	Water
Aniline Dyes	0.2 to 2%	Water
Aniline Oils	1 to 10%	Cocoa Butter
Arsenate, Lead	1%	Water
Arsenite, Potassium	0.5%	Water
Benzine	6%	Olive Oil
Bergamot, Oil of	10%	Lanolin
Betanaphthol	2%	Petrolatum
Bichloride, Mercury	0.1%	Water
Bichromate, Potassium	1%	Water
Bromide, Potassium	10 to 25%	Petrolatum
Bromide, Sodium	10 to 25%	Petrolatum
Cloves, Oil of	25%	Olive Oil
Dextrose	50%	Water
Ethyl Aminobenzoate (Anesthesin)	5%	Lanolin
Ferrocyanide, Potassium	10%	Water
Formalin	5%	Water
Hydrochloride, Quinine	1%	Water
Hydroquinone	1%	Water
Iodoform	25%	Lanolin
Iodide, Potassium	10 to 25%	Petrolatum
Iodide, Sodium	10 to 25%	Petrolatum
Compound Solution of Cresol (Lysol)	1%	Water
Naphthalene	1%	Alcohol
Nitrate, Nickel	5%	Water
Nitrate, Silver	3%	Water
Orris Root	20%	Lanolin
Paraphenylendiamine (Hair Dye)	2%	Alcohol
Peroxide, Hydrogen	5%	Water
Permanganate, Potassium	1%	Water
Phenol	2%	Water
Procaine	1%	Water
Pyrethrum	Powder or Commercial Spray	
Resorcinol	5%	Alcohol—Lanolin
Salicylic Acid	2%	Lanolin
Salicylate, Nicotine	10%	Water
Sulphate, Copper	10%	Water
Turpentine	25%	Olive Oil
Plants and Weeds, Pollen, Leaf, or (Commercial)	0.1%	Extract in Oil

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AN AMBULATORY TYPE OF FEVER TREATMENT FOR SYPHILIS OF THE CENTRAL NERVOUS SYSTEM*

(A Preliminary Report)

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THE need for an ambulatory type of fever treatment for syphilis of the central nervous system has long been recognized. It is generally thought that patients who have early asymptomatic syphilitic involvement of the central nervous system, as shown by changes in the spinal fluid, receive the most benefit from any type of fever therapy. As clinical signs of syphilis of the central nervous system appear and become more pronounced, the benefit from any type of treatment is less. O'Leary and Welsh,[1] among others, conclusively proved this opinion as far as malarial treatment is concerned. In this paper I am thinking mainly of an ambulatory treatment for these patients with asymptomatic syphilis of the central nervous system, but any treatment which would benefit them would obviously benefit the more advanced cases in a corresponding degree.

Most of the fever-producing agents now in vogue necessitate a long period of hospitalization while the patient is receiving the treatment as well as a long period of convalescence in the hospital or at home. Furthermore, expertly trained physicians, technicians, or both are required to properly administer the treatment. The necessary costly apparatus for producing fever mechanically or electrically is available to only a few physicians and patients. The comparatively rich or the very poor are the only patients who financially and economically can easily receive most of the present day fever treatments for syphilis.

The ideal fever treatment is one that would benefit the patient, one that could be given by every physician, one that would not require long periods of hospitalization and one that would not produce disabling illness or require prolonged convalescence. Such a treatment would allow the patient to maintain his financial and economic balance.

Pyrifer may be a step toward the goal for fever treatment of syphilis of the central nervous system. Pyrifer has been studied extensively in Europe and there are over 140 articles, mostly in German medical literature, discussing its use. It is a fever-producing bacteriological product marketed in ampules of graduated dosage for intravenous administration.

We have recently used it in three cases of syphilis of the central nervous system. The ability of Pyrifer to produce fever and the ease with which the patients tolerated the treatment are the only phases that can be reported at this time. The injections of Pyrifer were made every other day. A total of thirty-six injections were given to our patients. Four to six hours after each injection the fever appeared with or without an accompanying chill. The temperature ranged from 101.5° F. to 105° F. following each injection. The fever was sustained from one to two hours and then the temperature returned to normal. The only symptoms noticed were chills of varying degrees, some nausea, and one patient vomited during her last three (tenth to twelfth) fever bouts. The urine, blood urea nitrogen, and blood creatinine remained normal in each case. A slight secondary anemia developed in one patient. The hemoglobin dropped from 84 per cent to 70 per cent and the red blood cells dropped from 4,600,000 to 4,000,000. In our cases Pyrifer produced the desired fever and the patients tolerated it well.

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The advantages of Pyrifer over the common fever-producing agents are many. The patient can be given an injection of Pyrifer in the afternoon, return to his home, and have the fever that night. It must be said that the manufacturers state that the treatment should be carried out only in the hospital. However, with careful spacing of injections, and laboratory and physical examinations before each injection, it seems that the ambulatory treatment is safe. Pyrifer provides a fever which can be fairly accurately regulated as to time of appearance, duration, and intensity.

Malaria therapy is generally conceded to be the most beneficial fever treatment for syphilis of the central nervous system. It requires a long period of hospitalization and convalescence which Pyrifer does not. The long and extremely variable incubation period for malaria is eliminated when Pyrifer is used. The many complications of an added severe constitutional disease such as malaria were absent in our few cases. Inoculation malaria has been known to debilitate and sometimes kill patients after the paroxysms were thought to have been stopped by drugs given to kill the malarial parasites. The manufacturers state that Pyrifer contains no living bacteria. Pyrifer permits the simultaneous employment of arsenical compounds which would inhibit or stop malarial paroxysms. Malarial infected blood is difficult to obtain and a constant supply of patients must be ready for inoculation if the strain is to be preserved. The manufacturers state that Pyrifer keeps indefinitely. Fever cannot be produced in some patients by inoculation with malaria. The old, the debilitated, and those suffering from some constitutional disease are said to tolerate Pyrifer better than malaria. When Pyrifer is used it is not necessary to remove the cause of the fever as it is in malaria.

Expensive apparatus used in mechanical and electrical fever production is hereby eliminated, as is the trained technical staff needed to operate them.

In my experience, other bacterial products used to produce fever, such as typhoid vaccine, have always been very disappointing. Often the fever could not be repeated after the first two or three injections even with a marked increase in dosage. The same objections are offered for foreign protein medications, chiefly that the fever could not be regulated or be repeated after the first few injections. Pyrifer produces a fever even when given over a long period (twelve injections in our cases) with proper dosage and the courses or injections can be repeated as often as necessary.

Summary

Pyrifer is discussed as a fever-producing agent which may be used as an ambulatory type of fever treatment for syphilis of the central nervous system. In my slight experience, Pyrifer will produce fever which can be regulated as to onset, duration, and intensity. The patients tolerated the treatment exceptionally well. Time, prolonged clinical observation, and much more extensive use will tell whether or not Pyrifer will benefit the syphilitic patient.

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PRELIMINARY REPORT ON THE TREATMENT OF LYMPHOGRANULOMA INGUINALE BY HYPERPYREXIA

Report of Two Cases*

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SINCE the discovery of the Frei intradermal reaction[1] for lymphogranuloma inguinale, the diagnostic accuracy of acute and chronic inguinal adenopathy has been increased. The treatment, however, is not satisfactory as evidenced by the large number of suggested therapeutic procedures—X-ray, vaccine, antimony and potassium tartrate, Frei antigen, etc.

The cause of this disease is generally accepted to be due to a filtrable virus which, according to Sultzberger and Wise, is destroyed in vitro by temperatures of 60° C. and by chemicals. Because of the inflammatory characteristics, chronicity, localization and lack of response of this disease to treatment (Case I), it occurred to us to attempt hyperpyrexia in the treatment of this malady. After our observation of the first patient so treated, others were treated by the same method with apparently good clinical results.

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Method—Patients were treated by hyperpyrexia induced by diathermy, two to six sessions, with temperatures from 104° to 106° F. at five- to seven-day intervals.

Report of two Cases

Case I—R. G., a white male, age 24, was admitted to Minneapolis General Hospital on June 20, 1933. He gave a history that about four months previously, and one month after sexual exposure, he developed a small ulcer near the frenulum of the penis. This was treated by mercurochrome and disappeared in a few days. Two weeks before admission to the hospital there appeared several small ulcerated lesions near the corona of the penis and in seven days a swelling and tenderness in the right inguinal area.

His past history had no bearing on his present illness.

Physical examination was normal except for numerous small shallow inflammatory ulcerations involving the coronal sulcus of the penis. The lesions were painful and covered by yellow purulent exudate. The right inguinal glands were enlarged and matted together, slightly tender, and the overlying skin showed very little change from the normal.

Laboratory examination: The blood and urine examinations were normal. The Wassermann, Kahn, Kolmer, Kline were negative on two examinations. The dark field examination was negative for spirochaeta pallida.

Course and Treatment—The patient was discharged, after local treatment, on June 28, 1933. Diagnosis: Balanitis Erosiva.

Subsequent Course and Treatment—On July 6, 1933, the patient was re-admitted to the hospital with a complaint of increase in pain and swelling in the right inguinal region.

Examination at this time revealed a tender, indurated, boot-shaped mass, 2 in. x 3½ in. in size, above Poupart's ligament on the right side. One area in the center of this mass was covered by a bright inflammatory epidermis with a central area of fluctuation. The penile lesions were healed and there remained only shallow cicatricial scars at the sites of the previously described ulcers.

Laboratory. The Frei test was positive on July 19th and also on July 21st.

Treatment—The mass was treated with hot moist heat and the fluctuant area incised. From August 8th to October 12th, 1933, the patient was given two filtered deep X-ray treatments, several Frei antigens intradermally, and numerous intravenous injections of antimony and potassium tartrate.

Course—Temperature varied from normal to 100.4° F. The patient improved and there was a definite decrease in symptoms and signs. He was discharged October 16th, 1933.

On November 7th, 1933, the patient was again admitted to the hospital for the third time. He complained of swelling in the right and left inguinal regions, pain radiating down into the rectum, and difficulty in walking.

Examination at this time revealed board-like induration and swelling of the abdominal wall extending nearly to the costal margin on the right and to the level of the umbilicus on the left. There was no evidence of peritoneal irritation and the inflammatory reaction seemed to involve the entire anterior abdominal wall. Rectal examination was normal.

Treatment—On December 23rd, 1933, hot sitz baths were instituted as treatment, and these were continued daily until January 5th, 1934, when hyperpyrexia treatments were given. Three artificial fever treatments were given with temperatures to 104° (by mouth), and at 7-day intervals.

Course—The patient continued to have elevated temperature of 102° for several days after treatment. Two weeks after the last fever session the abdominal induration began to recede, rectal pain decreased, with the result that in about one month the induration and edema had involuted and the pain disappeared. When the patient was last seen, there had been no recurrence. The Frei antigen test had the same degree of positive reaction at the conclusion of treatment as at the time of the diagnosis.

Case II—W. N., a colored male, age 21, was admitted to Minneapolis General Hospital on August 4th, 1934, with a complaint of tenderness and swelling in the left groin of seven weeks' duration. This swelling had ruptured spontaneously and drained. There had been anorexia and a loss of 15 pounds in weight.

Past History. The patient had gonorrhea and a penile lesion one and a half years before the onset of his present illness.

Physical examination revealed an underweight male, with a palm-sized tender mass involving the left inguinal area. In the center of this were several fistulous openings from which could be expressed sero-purulent material. Near the frenulum of the penis was a superficial depigmented scar a few millimeters in diameter.

Laboratory. The Wassermann, Kolmer, Kahn and Kline tests were negative. The blood examination showed a leucocytosis and the urinalysis was normal. The Frei test was positive.

Treatment—The patient was given hot sitz baths from August 19th, 1934, to August 29th, 1934, which elevated the mouth temperature to 101° to 102° F. Beginning September 15th, 1934, a course of five diathermy hyperpyrexia treatments were given at one-week intervals, with a temperature to 106° rectal.

Progress—The patient was discharged as cured within one month after the last fever treatment. The swelling and induration had involuted, and the sinus tract was closed.

Course—Frei tests applied six months and one year after treatment were markedly positive. There has been no recurrence, discomfort or swelling in the groin.

Discussion

Two patients with lymphogranuloma inguinale are presented. Case I represents a severe reaction to the virus infection which was progressive and resistant to accepted methods of treatment. After the institution of hyperpyrexia, the symptoms and signs present subsided rapidly. Case II may have responded well to any of the methods used in Case I, but significant is the fact that the patient recovered rapidly after fever therapy.

The effect of heat and fever on patients with lymphogranuloma inguinale, in the light of present knowledge, is only speculative. The response may be a non-specific effect which, because of its use (fever for a number of hours), is superior to foreign protein injections in which the duration of the fever is limited to a shorter period of time. It is also permissible to assume that temperatures above normal, as used, may have an inhibitory effect on the virus. It is not probable that the causative agent is destroyed at this temperature as the thermal death point is probably incompatible with life of the host. The time necessary for satisfactory response to this method is short compared with other procedures which had been used previously and the general systemic reaction of the patients in the two reported cases was not severe enough to warrant discontinuance of this method of treatment. Significant also is the fact that, compared to other suggested methods of treatment, the response of the local lesions had no perceptible effect on the intradermal Frei reaction.

Conclusion

Two cases of lymphogranuloma inguinale are reported which were treated by artificially induced fever. Both patients responded well to this therapy.

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(These patients were treated in the Physiotherapy Department by Dr. M. E. Krapp.)

THE MOST FREQUENT REACTIONS ENCOUNTERED IN THE TREATMENT OF SYPHILIS*

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In view of the fact that nearly every one in the practice of medicine treats syphilis in one form or another, the mention of some of the reactions produced by the drugs used, might be of some practical aid.

In describing the reactions due to the Arsphenamines, we must distinguish between the local and the general reactions.

I. Local Reactions

If any of the Arsphenamines, except Sulpharsphenamine, is injected into the tissue, there is an immediate intense burning pain at the site of injection, and a swelling will be noticed. If only a few drops are spilled into the tissue, the patient may have a sore, aching arm for a while without any further difficulty.

If more than this, there develops a brawny edema, intense pain, sleepless nights, and loss of function of the arm. In more extensive infiltration, there may be a central softening with necrosis and sloughing, sometimes requiring months to heal. There may also develop crippling deformities due to fibrous scars about the elbow which may require plastic surgery.

Occasionally, pain in the arm is encountered during the injection. This pain may usually radiate from the shoulders to the fingers. This condition is usually more frequent when the old Arsphenamine is used. It is probably due to improper alkalinization.

II. General Reactions

1. Herxheimer Reaction:

This is called by some, therapeutic shock. In a small percentage of cases in early syphilis, the first injection may be followed in a few hours by elevation of temperature preceded by a chill, sometimes a general malaise, pain in the legs, and at the same time intensifying the early lesions for a short time.

In a few positive primary cases, a profuse secondary rash may make its appearance. Even in latent syphilis, a febrile constitutional symptom may occur. The pain of bone lesions is usually greatly intensified. In most patients, this condition is of little practical significance. However, in cases of gumma of the larynx, in cardiovascular syphilis, and in some patients with cerebro-spinal syphilis, most alarming symptoms may occur.

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If a large dose of Arsphenamine is given to a patient with gumma of the larynx, and edema and swelling may occur within a few days causing an impediment of respiration, and may necessitate an immediate tracheotomy. In cardio-vascular syphilis with an involvement of the coronary orifices, an occlusion may occur.

Therapeutic shock may be minimized or prevented by initiation treatment with small doses of Arsphenamine, or by thorough preparatory course of treatment with the heavy metals and Potassium iodides.

2. Reactions caused by Acid Arsphenamines:

If Acid Arsphenamine is injected, usually a series or phenomena occur with great rapidity. The patient will experience an immediate sense of oppression and pain in the chest, followed by continuous bursts of coughing. This is followed by excruciating back pain, ashen pallor, syncope, and circulatory collapse. If the dose is large enough, death may occur. With Neoarsphenamine, this condition is very rare, although it occasionally may occur.

3. Ether Odor Arsphenamine:

Most patients are conscious of the odor of Arsphenamine. The odor is described as resembling ether or garlic. This is caused by the arsenic, and by the ether used in the manufacture of the drug. Some very sensitive patients find the drug so intolerably disagreeable, that they will object to the continuation of the same.

4. Gastro-intestinal Reactions:

Intravenous injections of various substances are prone to be followed by gastro-intestinal disturbances. This is the most common form of reaction encountered in the administration of the Arsphenamines. It appears from four to twelve hours succeeding the treatment, and is characterized by nausea, headache, malaise, vomiting, and diarrhea. Ordinarily these symptoms last only a few hours, but sometimes, they are present several days.

These reactions are due to a variety of causes, the most important of which are the impurities of distilled water employed, excessive speed of injection, dietary indescretions, and constipation.

5. The Nitritoid Crises:

During the injection of the drug, or within a few minutes after, the patient complains of a feeling of warmth, of palpitation, and a sense of oppression in the chest. The first symptoms are usually of suffusion of the conjunctiva, followed by cutaneous flushing, choking cough, sometimes severe cramp-like pains in the lower back, and a fall of blood pressure.

More rarely, there is an edema of the face and lips, tongue, glottis, and a generalized urticarial eruption. There may be syncope with a thready, almost imperceptible pulse. In most cases, the patient is frightened by an impending collapse or death. It is at first just as alarming to the physician. Usually this condition lasts only from twenty to sixty minutes.

This type of reaction rarely followed the first injection of the Arsphenamine. If it occurs, it may be troublesome with subsequent injections. It is most common with the administration of Arsphenamine and Neoarsphenamine.

6. Shock-like Reactions:

Rarely one sees patients to whom an intravenous injection of Arsphenamine is followed either immediately or after a few hours by a condition clinically similar to an acute surgical shock. This is characterized by weakness, cyanosis, cold clammy skin, nausea, vomiting and collapse. The pulse is weak, rapid, and thready, and often imperceptible. The blood pressure may be lowerd to an alarming level. These may be alleviated by the usual shock-combating methods.

7. Myocardial Injury:

If large doses of Arsphenamine are given to patients with cardio-vascular syphilis, there may occur an immediate and very severe reaction, often followed by death. This is characterized by fainting, ashy-gray color, profuse diaphoresis. The pulse becomes rapidly imperceptible, and after a few gasps, the patient expires. This phenomen occurs only in patients with a preexisting myocardial change due to syphilis. It does not, as a rule, occur in patients who have myocardial changes due to other causes.

III. Post Arsphenamine Reactions:

The Minor Forms

The Arsphenamines are capable of producing a wide variety of toxic manifestations in the skin, varying from a simple eruption of no particular importance, to the grave and sometimes fatal exfoliative dermatitis.

1. Urticaria is usually associated with nitritoid crises. Hives appear during the injection of the drug, or within a few hours, and usually persist for a short period of time. This condition may reappear after subsequent injections.

2. Erythematous and scarletiniform rashes may, like urticaria, appear after a few hours, and may be accompanied by fever, malaise, nausea, vomiting, and headache. This condition is normally met with in early syphilis. It usually disappears from four to seventy-two hours.

3. Herpes Febrilis and Herpes Zoster rarely occur during the treatment with Arsphenamine, and are not accompanied, if they do occur, by any other evidence or drug intoxication.

Major Skin Manifestations

These have the same features and are characterized by itching, scaling of the skin associated with constitutional symptoms, and evidence of visceral damage. The interval between the treatment and the appearance of the rash varies from a few hours to as long as three weeks. The eruption usually begins as a maculo-papular or a vesicular eruption, often limited at first to the extremities, and rapidly spreading until the whole body is involved. In the milder cases, the maculo-papular eruption may not develop further, and gradually fades out in a few days. In the most severe cases, especially in the vesicular eruptions, marked scaling and exfoliation may occur, and the skin of the entire body is desquamated in large flakes. Often the entire palmar and plantar surfaces come away intact. The rash is accompanied by intense and almost intolerable itching. The exfoliation is usually complete in three to four weeks, but sometimes takes longer.

The mucosa as well as the skin may be involved in the exfoliative process, causing a severe conjunctivitis, vaginitis, diarrhea, edema and desquamation of the buccal surfaces, and an acute bronchitis. Associated evidence of generalized intoxication are present with varying degrees of frequency. Fever, malaise, and prostration are common. Renal damage with albuminuria and more rarely, hematuria, and a rapidly failing kidney function occur in some patients. Jaundice and polyneuritis are relatively frequent complications. There may be an associated susceptibility to intercurrent infections such as: boils, carbuncles, and broncho-pneumonia with death.

The appearance of the exfoliative dermatitis comes with unexpected and explosive force. The prodromal symptoms are sometimes lacking. In some patients, however, reactions may occur after each of the several doses before the final eruption appears. Generalized itching without any obvious skin rash, unexplained fever for twenty-four to forty-eight hours after each injection, malaise lasting for several days, and out of all proportions to the size of the dose, mild apparently insignificant eruptions, all of these may precede the major dermatitis by several weeks.

It should be the rule to inquire about reactions before the administration of each dose.

Dermatitis tends to appear early in the treatment, the majority of cases occurring within the first dozen or so injections. In our clinic, a dermatitis has been known to make its appearance between the third and fourth injections.

1. Polyneuritis:

Polyneuritis is a rare complication usually seen after giving a good deal of treatment, viz., twenty or more injections. The patient usually complains of numbness, burning, and tingling of hands and feet. These minor symptoms may clear up promptly when the drug is withdrawn. In very rare instances, the lesion progresses to the point of grave muscular weakness, wrist or foot drop, loss of deep reflexes, atrophy and stocking and glove anaesthesia. Recovery from this is very slow, and often incomplete.

2. Hemorrhagic Encephalitis:

This is a very grave, and uncommon complication of Arsphenamine therapy. It develops after relatively few injections, and is usually accompanied by a moderate fever, headache, apprehension, and apathy with convulsions. The convulsions appear more frequently, and finally, the patient goes into a comatose state with a severe cyanosis, and dyspnea. There is usually incontinence of urine and feces, the temperature rises, the pulse becomes rapid and thready, the respirations are Cheyne-Stokes in character, and death usually results. Fortunately, it is a very rare condition, we having seen only one case with complete recovery.

3. Post Arsphenamine Jaundice:

Jaundice is a fairly frequent complication of Arsphenamine therapy. When jaundice appears in the midst of anti-syphilitic treatment, it is not necessarily due to the treatment. It must be remembered that syphilitic patients are not immune from any other infection. Gall stones, cholecystitis, and other less frequent known causes of Icterus must be ruled out before the diagnosis of Post Arsphenamine Jaundice is permissable.

Jaundice appears at variable intervals ranging from a day to many months. The clinical picture varies from a mild symptomless jaundice to fatal acute yellow atrophy. Fortunately, the latter is uncommon. The usual case is indistinguishable from that of catarrhal jaundice; a day or so of malaise, slight fever, epigastric distress, generalized aching, anorexia, nausea, and vomiting, followed promptly by the appearance of rapidly deepening jaundice of the obstructive type.

As the jaundice develops, the symptoms disappear, and the patient usually feels well. A firm, slightly liver edge, is palpable, while pigment appears in the blood, and bile is found in the urine. The stools become clay colored. The fever is normally short lived, and in the majority of cases, the jaundice persists at the maximum intensity from ten to fourteen days, then fades slowly, disappearing completely in from three to eight weeks.

This is a picture of a typical case. In rare cases, we find signs of rapidly increasing severe injury to the liver. The patient will have a fever, intense jaundice, uncontrollable vomiting, mental dullness with apathy, and convulsions. Death may result within seven to fourteen days.

The Toxic Effects of Bismuth:

I. Local Reactions

1. Pain:

The intramuscular injection of most Bismuth products, both the soluble and the insoluble, is accompanied by some pain, the degree of the pain usually depending on the vehicle used. However, the pain is not so great as it is with Mercury, and with the correct technique, this condition can be minimized to almost nothing.

2. Accidental Intravenous Injections:

Owing to the increased toxicity of Bismuth when given into the blood stream, great care must be taken to avoid getting into the blood. If a vein is injected with an oil suspended in soluble Bismuth, the immediate effect of oil embolism is noticed clinically by a feeling of tightness in the chest, uncontrollable coughing, and sometimes, the patient will go into shock. We can also get a rapid onset of grave symptoms of Bismuth intoxication as a result of rapid absorption of Bismuth from the multiple emboli in the tissues. Fortunately, we never saw such a case in our clinic.

In very rare cases, an artery may be entered, and in such instances, the mass may be distributed as multiple emboli in the small arterioles supplying the buttocks. This condition is manifested by immediate severe local pain. Ischemia appears within a few hours, later, a localized hemorrhagic skin eruption appearing with a marked painful indurated buttock. In some cases, a necrosis with sloughing, and very slow healing may result.

II. General Reactions

1. Oral Cavity:

A bluish gray line will appear almost always over the gum margin, resembling lead poisoning, but less grave. It may also involve the buccal surfaces, the soft palate, and the velum. This condition may persist for years, and any effort to remove it by treatment is usually unsuccessful.

2. Stomatitis:

Ulcerative Stomatitis is less frequent than with Mercury. Usually, it is in direct proportion to the oral hygiene, that is the more frequent there is a gingivitis, the more common there is a stomatitis.

Occasionally, we may have an enteritis with bloody stools. Very rarely, do we see a case with nausea and vomiting following Bismuth. We may see a case of slight jaundice while taking Bismuth, but it is hard to tell whether such condition is due to the use of Arsphenamine along with the Bismuth. This condition does not warrant the discontinuation of the Bismuth.

3. Effect on the Kidneys:

Bismuth is a very slight diuretic. Changes in the renal functions have never been observed. It is even given to patients with already existing Nephritis, however, caution should be taken, by examining the urine first, and frequently.

4. Skin Eruptions:

These are very rare, and of little practical significance. Pruritis, urticaria, lichenoid eruptions, and exfoliative dermatitis have been described, but are very rare. We have seen only one such case in our clinic.

5. Peripheral Neuritis:

This is very rare with Bismuth, and if it does occur, it is very mild, and disappears quickly.

In general, it may be said that except for bluish pigmentation of the gums, and the buccal mucosa, the administration of Bismuth in the average therapeutic dose is markedly free of any toxic manifestations as compared with the Arsphenamines and the Mercury, and can be given over a longer period of time without any serious reactions.

Mercury

With the advent of Bismuth in the treatment of syphilis, Mercury has been almost completely abandoned in most clinics. The toxicity of Mercury, both general and local, is much more severe than with Bismuth.

Tryparsemide

The only important untoward reaction caused by Tryparsemide is damage to the optic nerves. Woods and Moore observed definite untoward reaction in 15.07 per cent of 241 patients. In 10 per cent of these cases, the reaction consisted of subjective complaints only. In the remaining cases, there were definite ophthalmologic findings.

Lazar reported five cases in a series of 32 neuro-syphilitics who suffered visual impairment during Tryparsemide therapy. In three cases, the relationship between administration of the drug and visual impairment was striking. In one case, the visual loss progressed to faulty projection. Stokes states that there is serious visual impairment in 1.5 to 2.5 per cent.

The reaction usually comes on before the sixth injection, but may take place as late as the tenth. After the twelfth injection, visual impairment practically never occurs. In Lazar's series, the changes—loss or reduction of vision or constricted fields—were seen after the first, second or third injections. The symptoms set in from a few hours to several weeks after the injection. They start as a dazzling or shimmering sensation which may shortly disappear or progress to complete blindness.

"There is no direct relationship to the dose of the drug administered provided a dose of three grams is not exceeded." (Moore)

It appears that the previously damaged optic nerve is more liable to a severe reaction than a normal nerve. The close ophthalmologic supervision required by any patient is to receive or who is receiving Tryparsemide is readily apparent.

Iodides

Since Iodides are still used by many in the treatment of syphilis, a few words in regard to the untoward reactions should be mentioned. In tuberculosis, especially, in the pulmonary type, the use of Iodides may become disastrous in that the tuberculous infection may spread. In some instances, a toxic goitre may be made worse.

Iodides may also cause a slight Coryzea, an unpleasant aching at the angles of the jaw, and may develop a metallic taste in the mouth. Unless these symptoms are very annoying to the patient, they may be disregarded.

There may also appear a mild skin eruption on the chest and face, and very rarely, a serious and sometimes fatal generalized skin eruption alangous to those produced by the Bromides. Fortunately, the severe eruptions are very rare.

Occasionally, one finds a patient who is completely intolerant to the drug. A single dose is followed by congestion of the nasal mucosa, by edema of the tongue and lips, of the glottis, or a generalized edema.

In general, the use of the Iodides causes such slight reactions, that a bare mention of the same is sufficient. This is also true of Acetarsone which is used in the treatment of congenital syphilis. No untoward reactions have been noticed in our clinic. Children tolerate the drug very well.

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GRANULOMA FISSURATUM (SUTTON)*

Additional Cases with Résumé

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In 1932 R. L. Sutton, Jr.,[1] called attention to this apparently previously unrecognized clinical entity. His report contained a detailed description of two examples of the disease. Closely following this original study similar cases were reported by Sutton, Sr.,[2] Greenbaum,[3] Diasio,[4] and Wachtler.[5] These together with the three additional cases of the present study bring the total to ten cases observed to date. The rapidity with which these subsequent reports have followed the original description suggests the possibility that the condition is of rather frequent occurrence and of some practical diagnostic importance. A comparative summary of information now available, including the three additional cases, is submitted with this in mind.

In the cases studied thus far, there is apparently complete agreement regarding the general course and clinical manifestations of the disease. The condition develops insidiously over a period of weeks or months, and with slight, or even relative absence of subjective symptoms. Following or during this period of development, symptoms of moderate discomfort may prompt an investigation on the part of the patient himself. Discovery of the lesion in this manner results in his seeking the advice of his physician. This need not be the rule, however. In one of our cases, discovery of the lesion was the result of a routine examination undertaken for unrelated reasons. So far as we now know the lesion always develops in the labio-alveolar sulcus. In the cases reported, including our own, it has varied in size from just less than a centimeter in length to the longest in our series which was just less than two centimeters. They are usually roughly round or oval in shape, and definitely project above the tissue from which they spring. As to their general appearance, Sutton's[1] original description seems entirely adequate: "They were about one centimeter in diameter, raised two to three millimeters from the general level and conspicuously indented by a fissure in the coronal plane which divided the tumor in half and which continued at either extremity into the normal mucosa of the unaffected part of the sulcus. The shape of the tumors was that of a folded coin, the fissure being within the bend. The mass was smooth and of a paler pink than the normal mucosa. The fissure was a bright red, narrow line across the center. The lesions were firm to the touch, but not so hard as an epithelioma. The bases did not feel deeply indurated and could be moved freely over the bone beneath. The borders were sharply raised and smoothly rounded. There was no inflammatory areola."

The three cases we have observed during the past two years simulate the foregoing. Case 1 (Fig. 1) occurred in a male, aged 72, who entered the University Hospital because of a fractured femur. During his period of hospitalization the complaint of a "sore mouth" resulted in dermatologic consultation. This revealed a typical tumor in the lower, left sulcus. The patient had worn upper and lower dentures for years. Sharp dissection was followed by prompt, uneventful healing. Histologic examination revealed the typical

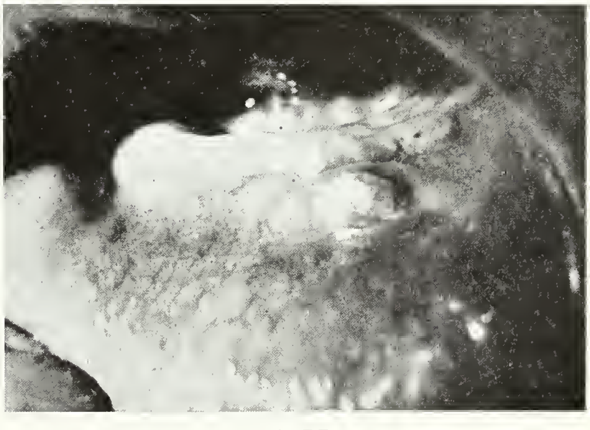

FIGURE 1
Case 1—Tumor just to left of midline of lower sulcus.

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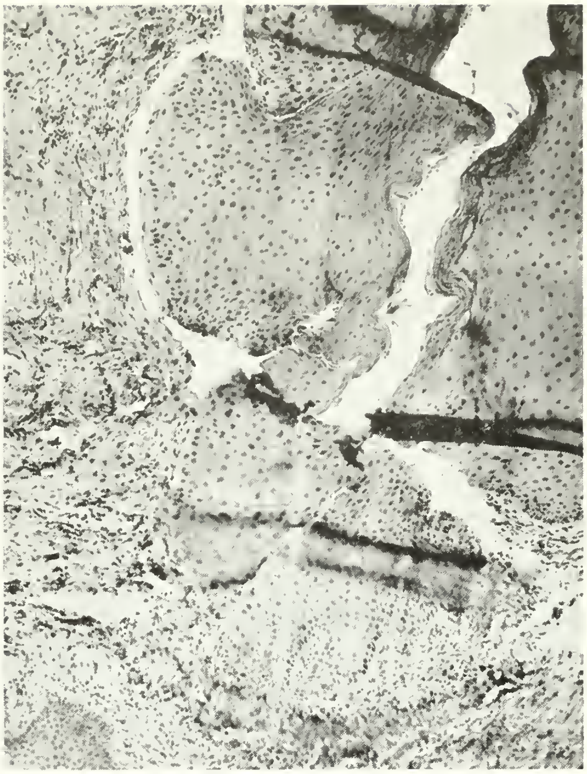

FIGURE 2
Photomicrograph of Case 1, showing fissure, acanthosis, cellular infiltration, etc.

changes (Fig. 2) recorded in Chart I. Case 2, female, age 59, entered the Out-patient Department of the University Hospital complaining of an upper respiratory infection. Routine examination revealed a typical fissured tumor of the upper left labio-alveolar sulcus. Questioning brought forth the information that dentures had been worn for years and that the lesion had never been painful. Sharp dissection resulted in prompt healing. Histologic examination revealed typical changes. Case 3 occurred in a woman, aged 42, entering the Out-patient Department for general examination. Upon discovery of a typical lesion in the left, upper labio-alveolar sulcus during the routine physical examination, the patient recalled occasional vague "soreness" over a period of several months. She stated she had worn artifical plates for years. The patient was advised to discard the dentures for ten days and to use a saline mouth wash frequently. Returning for observation later, further treatment was refused, and examination revealed only a slight trace of an entirely healed fissure.

Further data concerning the cases thus far studied, and including our own is shown in Chart I. From it, it is noted that in the cases observed thus far, it has been a disease of middle and late life. The youngest patient was thirty-eight; the eldest, seventy-two. The influence of sex would seem questionable, yet it has occurred in a ratio of eight females to two males. Apparently it may occur in either the superior or inferior sulcus, four being in the former location, six in the latter. The etiological importance of artificial dentures in the production of this disease is apparently open to some question. Suggestive at least is the fact that with one or possibly two exceptions, every case reported had worn dentures of some type. Further evidence favoring such a view are the instances in which these lesions have spontaneously involuted upon removal or correction of such a source of irritation. Examples of this are furnished by the two cases reported by Greenbaum and by Case 3 in our own series. Partial refutation of this theory, however, lies in the fact that in one of the original cases reported by Sutton, Jr., the patient possessed a "well preserved" set of teeth. Furthermore, in the case reported by Diasio, the patient had discarded dentures two months previous to discovery of the lesion presented at the time of consultation. Naturally the accuracy of this pa-

CHART I

					Pathology		
	Sex	Age	Location	Dentition	Vascular	Cellular	Epithelial
Sutton, Jr.—	Female	40	Superior Sulcus	No Denture	Many dilated new vessels.	Many leukocytes, mostly polymorpho nuclear.	Acanthosis.
	Female	72	Superior Sulcus	Wore Denture	Dilated vessels.	Marked leukocytic infiltration.	No special notation.
Sutton, Sr.—	Female	43	Lower Sulcus	Wore Denture	Increased vascularity.	Numerous polynuclear neutrophils eosinophils and plasma cells.	Swelling and degeneration.
Diasio—	Male	67	Lower Sulcus	Wore Denture Discarded	Large number of new vessels.	Lymphocytic and plasma cell infiltration.	Acanthosis.
Greenbaum—	Female	42	Lower Sulcus	Wore Denture	No biopsy—spontaneous healing.		
	Female	38	Lower Sulcus	Wore Denture	No biopsy—spontaneous healing.		
Wachtler—	Female	53	Lower Sulcus		Dilated vessels.	Lymphocytes, plasma cells, fibroblasts, eosinophils, etc.	Acanthosis.
Present Report—	Male	72	Lower Sulcus	Wore Denture	Few new blood vessels.	Plasma cell and lymphocytic infiltration.	Parakeratosis. Acanthosis.
	Female	59	Superior Sulcus	Wore Denture	Vascularity not striking.	Lymphocytic and polymorphonuclear infiltration.	Marked thickening of epithelium; acanthosis.
	Female	42	Superior Sulcus	Wore Denture	No biopsy—spontaneous healing.		

tient's statement rests upon his own powers of observation and is to be evaluated accordingly. Thus, while the evidence at present available would seem to favor mechanical traumata foremost among possible etiologic factors, the influence of oral infection remains for the future to exclude.

Histologically a relatively uniform architecture has been observed in all cases studied. Properly sectioned the fissure, a striking clinical feature, is observable. Epithelial hypertrophy is present in the form of marked acanthosis, in some instances parakeratosis and marked elongation of the rete pegs, etc. In no recorded instance has there occurred a "breaking through" of the basement membrane, abnormal mitotic figures, nor any other suggestions of malignant, neoplastic growth. The cellular pathology presented is that of lymphocytic infiltration including lymphocytes, plasma cells, etc. Most studies have shown a pronounced fibrosis. In the majority of sections, the vascular change has been worthy of mention in the new blood vessel formation. In other words, while not evident clinically, these lesions are definitely vascular lesions.

Summary

Data presented herein would seem to reemphasize Sutton's granuloma as a definite clinical picture. So far as can now be determined it tends to occur after forty, more frequently in the female, and with a distribution limited to the superior and inferior labio-alveolar sulci. Microscopically its structure suggests a close relationship if not identity, to granuloma telangiectodes. The tumor's distribution and clinical characteristics are at variance with this view. Evidence thus far points to oral traumata, mechanical or infectious, as the causative mechanism; a benign rather than a malignant type of tissue response. The frequency with which subsequent reports have followed the original description suggests mis-diagnosis in the past; a need for closer clinico-pathologic interpretation in the future.

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The Problem of Malposture and Visceroptosis

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THE purpose of this paper is to analyze and discuss human posture in its normal and pathological states and to point out the accepted principles in their prophylaxis and treatment. I will confine myself, however, to those deformities, which occur in the antero-posterior plane, omitting any discussion of the more intricate problems of the lateral curves, which we term scoliosis.

Evolutionary Changes in Posture

The evolutionary changes incident to man's biped stance occurred principally in functional adaptability of appendages, but with little alteration in anatomy, per se. The human body differs not radically from that of the quadruped excepting mechanistically as follows:

1. The anterior extremities in the quadruped are supportive while in the human they hang from the shoulder girdle and must be supported by the spinal column.

2. Viscera in the quadruped exert their pull in a line perpendicular to a horizontal spine, while in man the pull of the viscera is parallel to a vertical spinal column.

3. A third important change is seen in the effect which gravity plays during inspiration. In the four-footed animal gravitational forces aid this phase of breathing, while in man they act against any inspiratory motion, for correct inspiration is conditional upon a cephalad as well as a forward motion of the sternum with consequent elevation of the ribs.

Mechanics of Body Balance

According to Steindler, the normal body balance depends on "certain proper relations between three mechanical units: A primary, the spine; two secondaries, the thoracic cage and the abdominal cavity."

The following examples illustrate how these three systems are interrelated and how an insufficiency in one may cause an insufficiency in the other two.

Example I—A boy with an epiphysitis vertebrae develops a dorsal rotundum. This deformity throws the chest into a more expiratory positional phase; in turn, the dome of the diaphragm falls to a lower level, causing compensatory changes in the abdominal contour according to hydrostatic laws. The change in shape will be a bulging-out and the natural place for such is in the ventral portion. Thus an abdominal ptosis is established and all three systems are in decompensation.

Example II—Beginning with the abdominal muscles as the first point in the break-down, one notes that the viscera seek a lower level. Hydrostatically, the diaphragm descends, and the chest will assume a more expiratory phase. With two systems in failure, the spinal column becomes vulnerable to gravitational forces acting upon it, the erector spinae muscles gradually lose their tone and the round, hollow back soon follows.

Example III—Most of the chronic chest conditions as bronchiectasis, pulmonary tuberculosis and chronic empyema, lead to the development of a flat, sunken chest wall—the diaphragm falls, the ribs point obliquely downward; the thoracic cage is in a state of mechanical failure, and soon this leads to a spinal and abdominal insufficiency.

Normal Posture Defined

Let us at this point attempt to formulate a standard for posture according to mechanical laws; bearing in mind that even at best, the standards are relatively crude.

Jones & Lovett define normal posture as the "erect, well-balanced attitude assumed by a muscular adolescent or adult." It is the attitude of balance and ease and the attitude of muscular efficiency and vigor. In a stricter sense we may look upon the human body as having its center of gravity in the pelvis just below the lumbosacral junction. In the upright position, however, the body is in a state of unstable equilibrium, and the conditions for maintaining this upright position are first that the center of gravity be over the base of support and that the line of gravity (which is a perpendicular dropped from the center of gravity) fall within this base.

According to Steindler, the body is in or near an equilibrium when the line of gravity passes from the tip of the mastoid process to a point just in front of the head of the astragalus. This

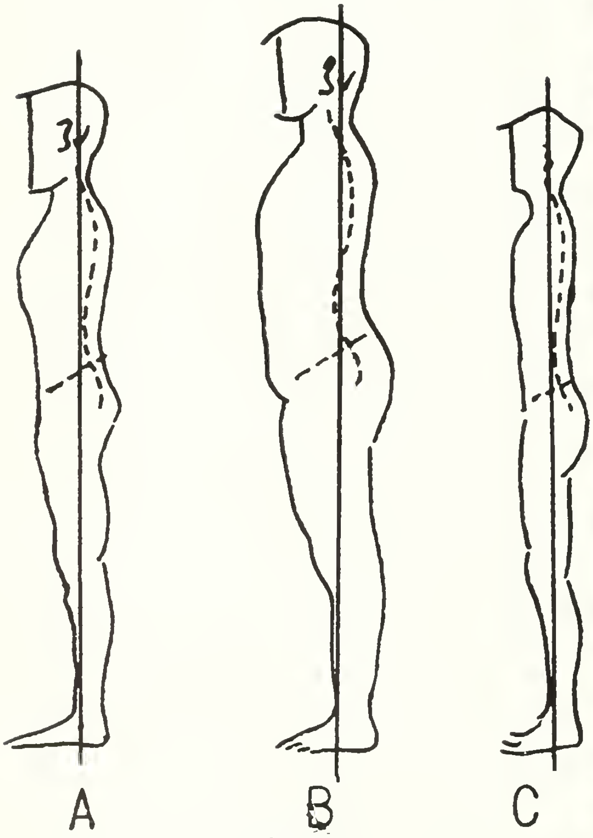

FIGURE 1
Normal postures. Note line of gravity. A—medium; B—stout, C—slender.

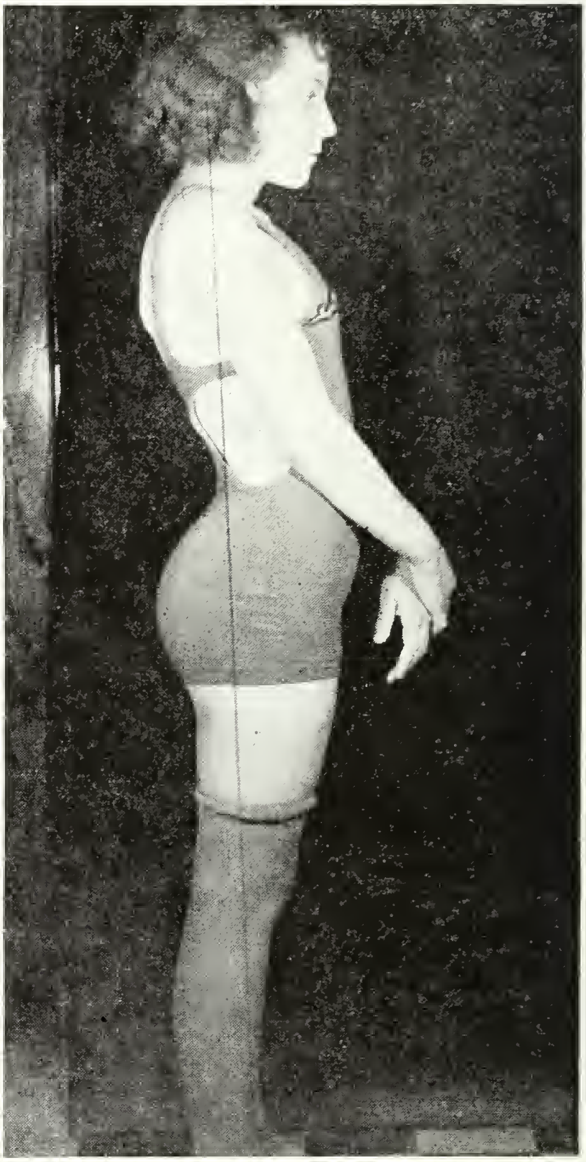

FIGURE 2
Round hollow back improving under exercises.

line also passing in front of the cervico-dorsal and lumbo-sacral junctions and through the axis of rotation of the knee joint (Figure 1).

Good posture is not conditional upon the above requirements alone, however, for a patient with a round, hollow back may be so compensated as to include all of the above requirements (Figure 2).

Thus, to formulate a working standard for human posture, the above mechanical requirements must of necessity, be satisfied. But the more practical standards of body grace, ease and beauty must also be fulfilled in order to add life and warmth to the picture. So our definition must be a broad one even though it be crude. On clinical grounds, a subgrouping according to the tall, medium and stout is both imperative and helpful (Figure 1).

Classification of Pathological Postures

A. Those in which the physiological curves are accentuated.
   1. Increase in dorsal curve—"dorsal rotundum" (Figure 3).
   2. Increase in lumbar curve—"lordosis" (Figure 4).

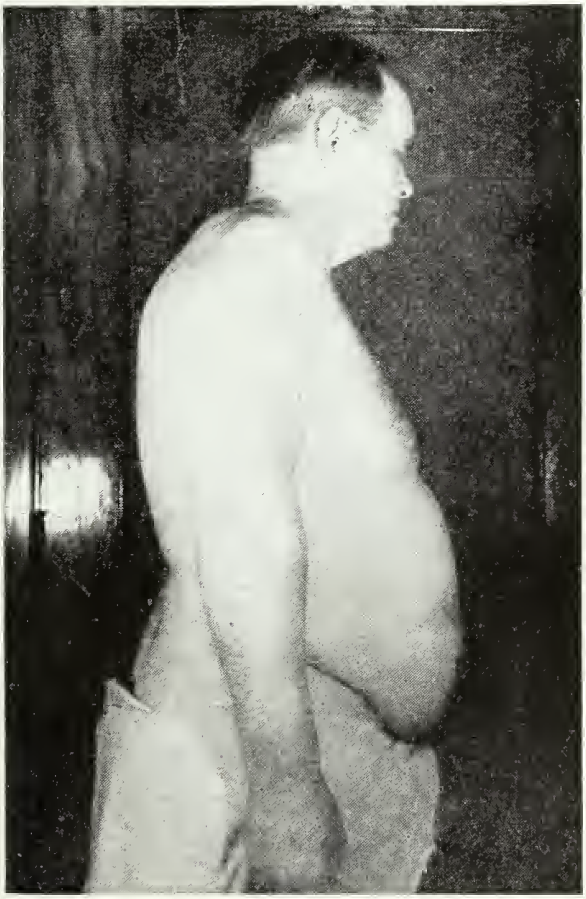

FIGURE 3
Male, age 54. With premature senile kyphosis and marked visceroptosis.

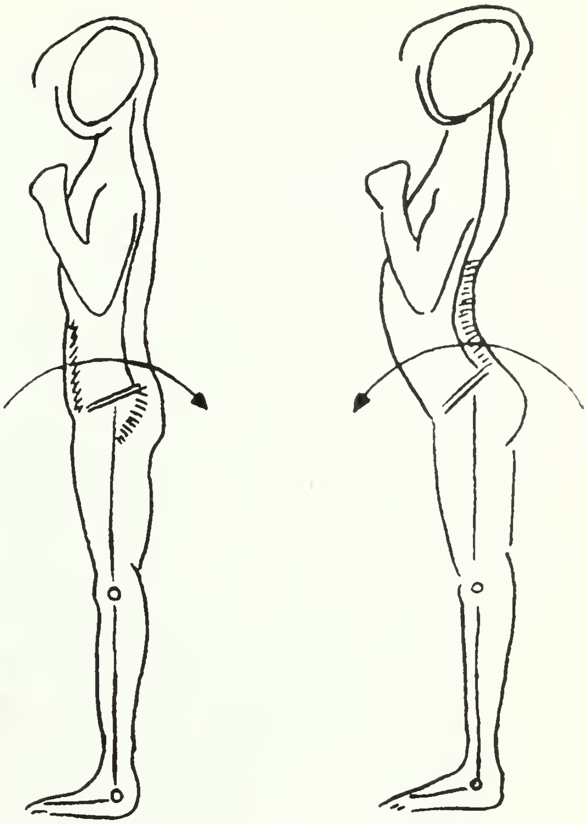

FIGURE 4
Pelvic rotations. A—Abdominals and gluteals contracted. B—Lumbar muscles contracted.

   3. Increase in both curves — "round-hollow back" (Figure 2).

B. Those in which the physiological curves are decreased or obliterated—"flat back."

The first of these, A-1, deserves special note for it is seen so often in orthopedic practice. Figure 5 shows the typical picture in an early case of epiphysitis vertebrae with definite changes in the region of the epiphyseal rings showing fragmentation, haziness, and a moth-eaten appearance. The normal epiphyses seen in adolescents, cast a uniform shadow with clear cut outlines. This condition was termed "osteochondritis deformans dorsalis" by Scheuermann, but is often spoken of as "epiphysitis vertebrae."

Case 14650 is that of a boy, age 18, who received an injury to the dorsal spine while playing football. Two days later he complained of diffuse pain in the dorsal spine. There was no history of back trouble previously. Examination showed a well developed youth with normal posture (See Figure 5). X-rays, however, showed changes characteristic of epiphysitis vertebrae with beginning wedging of three or four of the bodies. Treatment consisted of calcium re-inforcement and the application of well fitting body brace. The

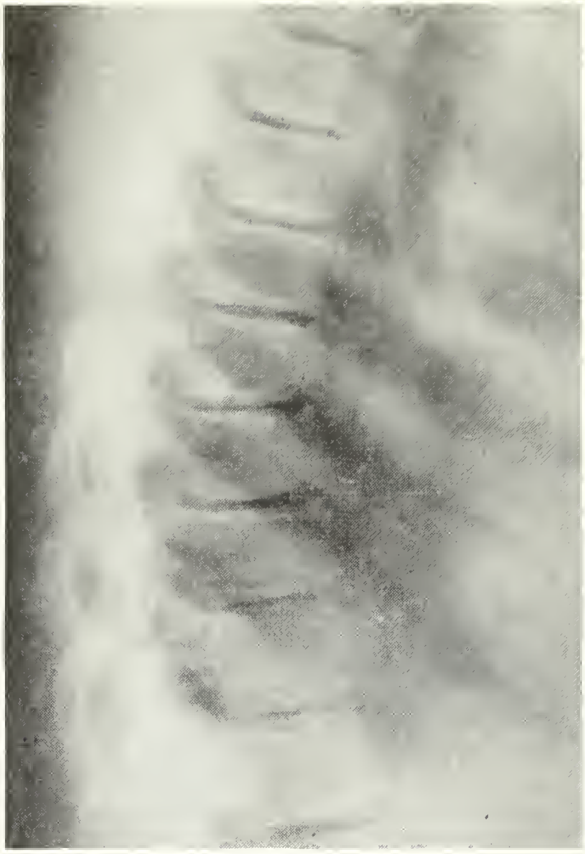

FIGURE 5
Male, age 18. Early epiphysitis vertebrae. Note fragmentation and haziness of epiphyses.

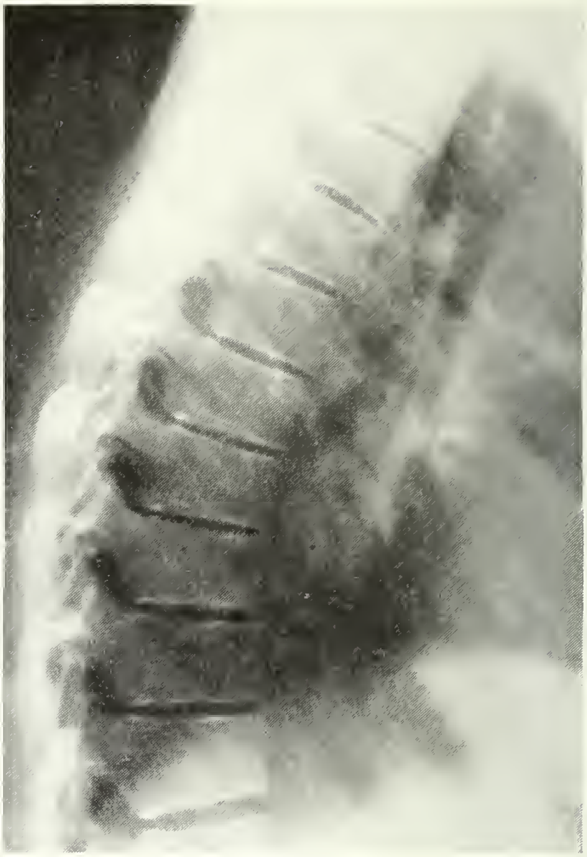

FIGURE 6
Female, age 26. Note wedging and dorsal rotundum as result of an old epiphysitis vertebrae.

prognosis in this case should be excellent because of the early treatment.

Figure 6 shows the X-rays of a female, age 26 years, who was seen in September, 1935, complaining of back pain, which she had had for many years together with a slowly advancing dorsal rotundum. She had no treatment during adolescent years when ordinary orthopedic measures would have been effective. Wedging has taken place and the deformity is so marked that the lower ribs are found riding in the false pelvis. A body brace, together with vigorous physiotherapy soon effected a symptomatic cure, but nothing will ever eradicate the deformity.

Lordosis (A-2) as a primary deformity is rare but occurs usually as a secondary process compensatory to some disalignment above or below. Round, hollow back (Figure 2); bilateral dislocation of the hips; flexion contracture of the hips and spondylolisthesis are among the common causes of increases in the lumbar curve.

Under Group B is listed the flat back, in which the physiological curves are decreased or even obliterated. Very rarely does one see a reversal of the normal curve unless it be a gibbus in the lumbar area.

Senile Changes in the Spine

These appear to be physiological. Figure 3 shows a lateral view of the picture so commonly seen in the aged subject. At the beginning of the sixth or seventh decades of life, these changes make their appearance and the so-called "senile kyphosis" is the usual form assumed. This process is due to a shrinking of the inter-vertebrae discs (principally of the nucleus pulposis) with a consequent shortening in the length of the spine, particularly in its anterior portion. The head bends forward, patient loses body height, and he often experiences pain at the base of the cervical spine and upper dorsal areas because of muscle fatigue. While such curves may be "physiological," care must be taken not to overlook any serious pathology as Pott's, Paget's or Kümmel's disease.

Treatment

Figure 7 illustrates the degree of pot-belly normally seen in childhood, and unless there be an exaggeration of this combined with lordosis and waddle-gait, it is likely that there is nothing wrong in the hip joints and his posture, therefore, must be taken as normal. By the time he has reached

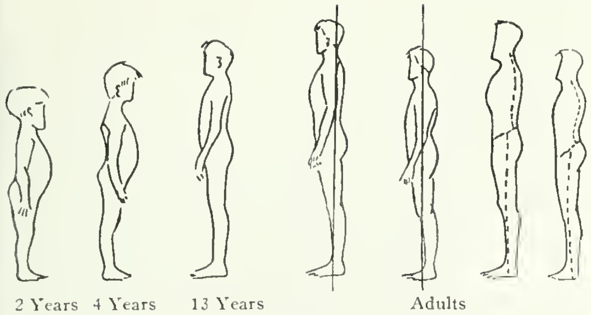

FIGURE 7
Normal posture for various age groups.

puberty, the abdominal ptosis will have gradually disappeared and the body will then be erect and graceful. But it is in these adolescent years that we see malposture in its strictest sense and it is in this period that prophylactic and therapeutic measures must be rigidly enforced.

Our policy is to begin with a general physical examination including all necessary laboratory tests. Such an examination should and does include a search for foci of infection, particularly of the upper air passages. Any indication of heart disease, pulmonary tuberculosis, nephritis, etc., will, of course, preclude any form of postural exercises for a time at least.

We believe that poor health is the precursor of malposture in many instances so that the general health of the child is first built up and when the child is sufficiently strong to permit corrective exercises, he is promptly "sent to the gymnasium."

Exercises

These are divided into three main types according to the purpose which they may be designed to accomplish:

1. Stretching exercises.
2. Strengthening exercises.
3. Poise exercises.

In order to straighten any curved material it is first necessary to stretch contracted structures on the concave side of that curve, thus in a kyphosis, the pectorals are usually contracted and the ribs are pointing forward in a more oblique direction. Below the kyphus there is usually a lordosis so that the deep lumbar muscles are in a state of contracture. These groups must be limbered up and stretched in preparation for the second set of exercises. Figure 8 shows some of the stretching procedures used.

Strengthening exercises for the muscles on the convex side of the curve are begun only after the above muscles have been actively or passively lengthened. These are shown in Figure 9, and many modifications are in popular use. The objective is reached only after many hours of conscientious work on the part of both patient and parents. The groups requiring the most work are the deep muscles of the back and the abdominals, particularly the recti.

The next step is to teach him the poise exercises, which at first will be found difficult. A favorite one is as follows: "Back to wall. Head, shoulders, hips and heels touching. Chin in and chest up with the weight resting on the balls of the feet and feet parallel. Flatten the back, retract the abdomen and stretch tall. Hold this posi-

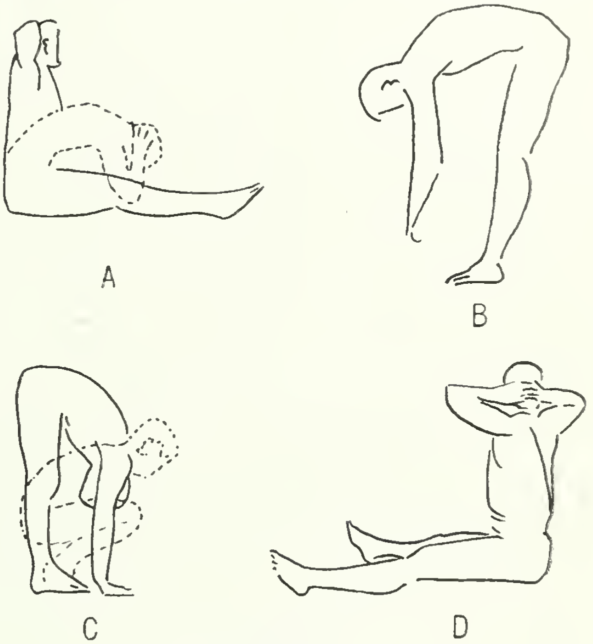

FIGURE 8
Stretching and limbering-up exercises.

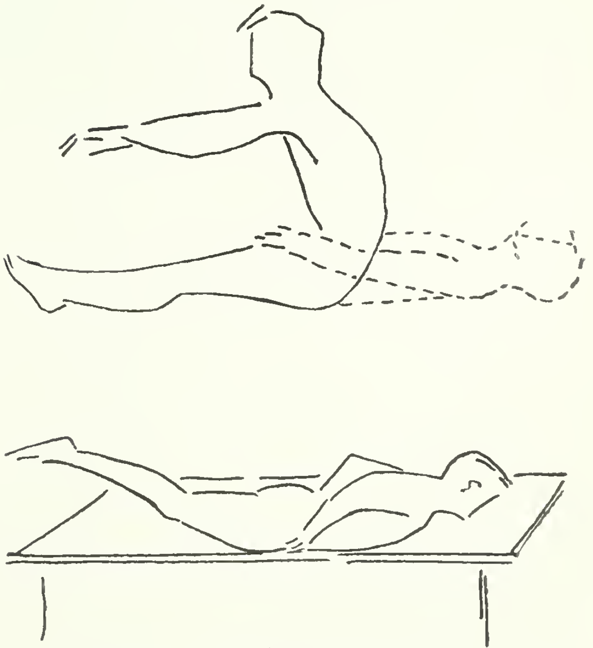

FIGURE 9
Strengthening exercises for abdomen and back.

tion and walk away. Do at least ten times off and on during the day."*

Weeks, months, and in some cases even years, may pass before the desired results are obtained, but they will come in time. The exercises can be made grand fun if presented in the proper way. The results in some cases are indeed a revelation not only physically but mentally as well. These children are brighter, happier, and certainly more energetic after the course is completed. Close follow-up during the first six months is required, then a yearly examination is usually all that is needed.

Orthopedic Adjuncts in Treatment of Malposture

Retentive appliances must be used at times; always in the paralytics, and always in the presence of an epiphysitis. Those malpostures, which are slow in responding to treatment, are usually given a brace temporarily in order to prevent undue muscle fatigue.

The treatment of malposture in adults is by no means brilliant when one compares the results obtained in youth. A proper restitution of form can seldom be achieved because permanent adaptive changes have already taken place in the vertebral bodies precluding seven forceful corrections. Much can be done with the arthritic and senile spines, however, in relieving the constant pain, which most of these patients suffer. The usual arthritic regime should be tried, including Crow's vaccine, or sulphur, physio-therapy, and some sort of body support. A spring back body brace properly fitted will ofttimes give immediate and permanent relief.

Operative treatment includes any correction of disalignments resulting from stiffness or ankylosis of joints in the lower extremity, which may effect posture. The back knee deformity is often due to a tight tendon-achilles and thus may be easily corrected by a simple tenotomy. Flexion contractures of the hips or hip following infantile paralysis or ankylosing arthritis may be corrected by the Soutter operation or the osteotomy. Burn contractures, especially those on the ventral surface of the neck or in the groin may be released by the methods employed in plastic surgery. The spinal fusion is used in selected cases when the deformities are progressive or when the usual conservative methods fail.

Summary and Conclusions

1. Evolutionary changes leading to biped stance are discussed and the mechanics of body balance are analyzed.

2. Practical standards for normal posture are given and evaluated.

3. Malposture is classified; examples and illustrations included according to four main types.

4. Treatment is most effective in the adolescent or early adult years before permanent adaptive changes have taken place in the spinal column.

5. Representative exercises are illustrated.

6. Auxiliary methods including braces and operative work are discussed.

7. There is a growing need for early orthopedic supervision of the growing child who may be afflicted with malposture.

8. Proper local and general measures will effect a cure in practically all of the early cases.

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Fifth Annual Report
of the
Tuberculosis Committee, American Student Health Association
Sixteenth Annual Meeting
Hotel Pennsylvania, New York, December 27-28, 1935

THE Tuberculosis Committee of the American Student Health Association was formed in the summer of 1931 and was the direct result of a preliminary conference on "Tuberculosis in College Students" which was held in Cleveland, July 14 and 15 of that year. Since 1931 reports have been made each year to the Association and the present one is the fifth, covering the school year 1934-35.

As in previous years, the Committee, with the Advisory Members, sponsored a "College Hygiene Luncheon" at the annual meeting of the National Tuberculosis Association at Saranac Lake, June 24-27, 1935. Doctor D. F. Smiley, Director of Health and Physical Education of New York State, talked on "College Hygiene in its Relation to Present Social Conditions," and Doctor Esmond R. Long, of the Phipps Institute, Philadelphia, spoke briefly on "Tuberculosis in College Students." About 150 people from widely scattered sections of the country attended this meeting, and a great deal of interest was manifested.

In its work the Committee has had three main objectives:

1. To formulate a suitable program for tuberculosis in college students. This was presented in 1932 and has since been widely distributed. The essentials of this program, which are routine tuberculin testing and X-raying, are quite generally accepted at the present time.
2. Through the sectional groups of the American Student Health Association to stimulate interest in tuberculosis and to bring about the adoption of definite programs for its control at all the institutions of higher education.
3. To collect statistics on the incidence of tuberculosis and results of tuberculin testing in college students. This was started for the school year 1932-33, and has continued each year since then. This report contains the figures for the school year 1934-35.

We are glad to report that during the year 1934-35 very marked progress was made toward the achievement of our goal. Perhaps the best indication of the widespread interest in the subject is in the number of papers which have been read at various state and national meetings. It has become common practice to have at least one paper on tuberculosis in the programs of the meetings of the various student health organizations. A good example of this is the paper on "Control of Tuberculosis Among Students," read by Doctor Walter H. Mytinger, of William Ross Sanatorium, Lafayette, Indiana, at the meeting of the Indiana Student Health Association at Greencastle, Indiana, on December 7, 1935. Another example is the paper on "The Surgical Treatment of Pulmonary Tuberculosis," which was read by Doctor R. C. McKay, Director of the Tuberculosis Pavilion at Cleveland City Hospital, before the meeting of the Ohio Student Health Association at Columbus, Ohio, on April 5, 1935. Space will not permit us to enumerate more of these, but it is hoped that their number will increase as time goes on.

Another significant advance has been made in the number of complete surveys in relation to tuberculosis which have been made at various institutions throughout the country. As an example of this we should like to cite the surveys made by tuberculin testing and X-ray under the direction of the Washington State Tuberculosis Association at the Normal Schools at Bellingham and Ellensburg and at Walla Walla College. These were carefully organized, well executed, and resulted in the accumulation of a large amount of valuable data on tuberculosis at these institutions. Similar surveys have been made for two years at the University of Wisconsin under the direction of Dr. R. H. Stiehm, and some of the results were published in the American Review of Tuberculosis in August, 1935. Thus we are gradually assembling the facts about tuberculosis in college students which should give us the foundation for the solution of our problem.

Last year we reported on an extensive program of tuberculin testing and X-raying carried out in ten normal schools of New York State by Doctor William P. Brown, of the State Education Department. This work was continued during 1934-35. In addition, we are glad to report a similar survey in sixteen institutions, chiefly normal schools, in Michigan, under the direction of the Michigan State Tuberculosis Association, 586 students were tested. The Committee feels that this work in normal schools is of the greatest importance, and as expressed in our report last year, we are hoping that what has been done in New York, Washington, and Michigan, will stimulate similar surveys in other states. Already one is under way in the State of Mississippi, and we should be able to report on it next year.

The year 1934-35 was marked by the more extensive use of the new P.P.D. Tuberculin developed by Doctors Esmond R. Long and Florence Seibert. At the College Hygiene Luncheon at Saranac Lake in June, 1935, Doctor Long announced that the new tuberculin would be made available free to institutions that would inaugurate tuberculin testing on a large scale. This overcame the chief objection to P.P.D.—namely its cost; and it seems probable that this will soon become the standard tuberculin for use in testing college students. This material has also been made available in small units which will reduce the price for individual tests. The ease with which the tuberculin is prepared and its uniform potency commend it for general use.

The conditions under which P.P.D. is distributed free are as follows: "The Henry Phipps Institute will furnish P.P.D. free in stable solution to those colleges making not less than 500 complete tests (1st and 2nd dose as needed) and returning their results on short standard summary forms to Doctor Long, provided the tests are done on groups of 50 or larger on each day of testing, so that the material is economically used. Instructions and forms accompany the material supplied." All institutions interested in procuring P.P.D. should write to Doctor Esmond R. Long, care of the Phipps Institute, 7th and Lombard Streets, Philadelphia, Pennsylvania.

In the report of this Committee for 1933-34, mention was made of the tuberculosis work being started in the negro colleges of the south. Early in 1935 the negro institutions were organized into a Student Health Association and the actual tuberculosis work started October 1, 1935. The following institutions have entered upon a definite program:

Hampton Institute, Hampton, Virginia.
Howard University, Washington, D. C.
Miner Teachers College, Washington, D. C.
Tuskegee Institute, Tuskegee, Alabama.
State Teachers College, Orangeburg, S. C.
Claflin College, Orangeburg, S. C.
State Teachers College, Montgomery, Alabama.
Agricultural, Mechanical, & Normal College, Pine Bluff, Ark.
Morehouse College, Atlanta, Georgia.
Maryland Normal School, Bowie, Md.
Wilberforce University, Wilberforce, Ohio.
Virginia State College for Negroes, Petersburg, Va.

A Tuberculosis Committee for the Negro colleges has been formed, and consists of:

Dr. Henry Allen, Howard University.
Dr. Paul B. Cornely, Howard University.
Dr. Eugene Dibble, Tuskegee Institute.
Dr. Cook, Virginia Union University.

This Committee will be enlarged as may seem advisable. As there are some one hundred negro colleges in the south and about 90 per cent of their enrollment become teachers in the negro schools of the south, it is easy to understand the importance of this work. Much credit for its development is due Mr. Franklin O. Nichols, working under the direction of the National Tuberculosis Association.

At the Second National Conference on College Hygiene, to be held in Washington, December 28-31, 1936, the Tuberculosis Committee of this Association will be a part of a larger group to deal with the problem of tuberculosis in college students. It is hoped that all those who are vitally interested in the subject will be united in a working unit, and by carefully reviewing what has been accomplished to date, may plan an effective program for the future. It would seem that these conferences at five-year intervals to go over all the aspects of college health work will prove most helpful in the elimination of tuberculosis as a major health hazard to students.

In giving the statistics on tuberculosis and tuberculin testing for the school year 1934-35, we will use the same grouping as in previous reports. Group I consists of all institutions having an active health service and an active tuberculosis program. In Group II we have placed those institutions having health services, but no active tuberculosis program, or one which has just been started. In Group III we have put all institutions furnishing statistics on tuberculin testing only.

In Group I for 1934-35 we have 17 institutions as follows:

Agnes Scott College, Decatur, Ga.
Ball State Teachers College, Muncie, Ind.
University of California.
Cornell University.
Iowa State College, Ames, Ia.
University of Kansas.
University of Michigan.
University of Minnesota.
University of North Carolina (Chapel Hill).
University of North Carolina, Women's College, Greensburg.
Ohio Wesleyan University.
University of Pennsylvania.
Stanford University.
University of Washington.
University of Wisconsin.
Yale University.
Western Reserve University.

For 1934-35 the Committee had reports in Group I on 85,428 college students, 57,016 men and 28,412 women. The group showed 491 cases of adult type pulmonary tuberculosis, or .57 per cent; the men 323 cases or .56 per cent; the women 168 cases or .59 per cent. In Group II were three institutions, representing 13,000 students and showing only 16 cases or .12 per cent.

As the statistics in Group I are the most accurate available at the present time, a comparison of these with the two previous years should be interesting. The following are the results:

	Men	Women
1932-33—38,932 Students 6.7 cases per 1000	6.4	7.5
1933-34—71,611 Students 5.9 cases per 1000	5.6	6.7
1934-35—85,428 Students 5.7 cases per 1000	5.6	5.9

COMPARATIVE STATISTICS

GROUP I

	School Year 1932-33			School Year 1933-34			School Year 1934-35		
	Number of Schools, 7			Number of Schools, 14			Number of Schools, 17		
	No. of Students	Tuberculosis No. Cases	%	No. of Students	Tuberculosis No. Cases	%	No. of Students	Tuberculosis No. Cases	%
Men	28,091	180	.64%	49,721	279	.56%	57,016	323	.56%
Women	10,841	82	.75%	21,890	147	.67%	28,412	168	.59%
Total	38,932	262	.67%	71,611	426	.59%	85,428	491	.57%

GROUP II

	Number of Schools, 4			Number of Schools, 5			Number of Schools, 3		
Men	9,290	7	.07%	8,116	10	.12%	8,975	12	.13%
Women	6,084	4	.06%	5,591	9	.16%	4,025	4	.10%
Total	15,374	11	.07%	13,707	19	.14%	13,000	16	.12%

TUBERCULIN TESTING

	School Year 1932-33			School Year 1933-34			School Year 1934-35		
	Number of Schools, 12			Number of Schools, 38			Number of Schools, 42		
	No. Tested	No. Positive	%	No. Tested	No. Positive	%	No. Tested	No. Positive	%
Total—Men and Women Not Separated	14,318	5,075	35%	25,184	7,648	30.3%	26,861	7,921	29.4%
Including									
Men	6,959	2,442	35%	12,653	3,835	30.3%	15,783	4,841	30.6%
Women	4,508	1,244	27%	8,145	2,158	26.4%	9.929	2,770	27.8%

It is hardly possible to draw conclusions from these figures, but if this yearly census is continued we should eventually have a true indicator of the tuberculosis trend in our student population.

Reports on tuberculin testing for 1934-35 were received from 42 institutions. A total of 26,861 students were tested with 7,921 positives or 29.4 per cent; of 15,783 men, 4,841 were positive or 30.6 per cent; of 9,929 women, 2,770 were positive, or 27.8 per cent.

A comparison of the three years during which statistics for tuberculin testing have been tabulated gives the following results:

	Men	Women
1932–33—14,318 Tested 35% positive	35%	27%
1933–34—25,184 Tested 30.3% positive	30%	26%
1934–35—26,861 Tested 29.4% positive	30%	27.8%

It is interesting to note that each year the girls have a lower percentage of positive tuberculin reactions, but a higher percentage of tuberculosis.

The comparative statistics for tuberculosis and tuberculin testing collected by the Committee for the three years 1932-33, 1933-34, 1934-35 are appended to this report.

As in previous years, the Committee wishes to thank all the members of this Association who have helped to make the report possible. We bespeak your continued support and co-operation in the task of eliminating tuberculosis as a major menace to American student life.

Respectfully submitted,
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Acne and Its Relation to the Endocrines*

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ACNE is undoubtedly the commonest skin disease of the second and third decades of life. It[3] is estimated that acne patients constitute about 8.5 per cent of all cases seen in dermatologic practice. Bloch's[4] summaries of the results of the examination of 4,191 children between the ages of 6-19 years, of both sexes, show that, if one considers the comedo the essential lesion of acne, a few such lesions occur in an amazingly high percentage, 64 per cent in this series. The percentage of individuals suffering from acne increases with age, and reaches its maximum in the seventeenth year for girls, and the eighteenth year for boys; only 3.4 per cent of girls in that group, and 0.6 per cent of boys were entirely free from the eruption.

Etiology—Review of Literature

Many attempts have been made to approach the problem of the etiology of acne chemically, metabolically, and by histological and bacteriological methods, with, however, little success. Unna,[5] in 1893, first described a microbacillus, termed acne bacillus; Sabouraud[6] regarded acne as a local infectious disease of the skin based on a primary seborrhea; Gilchrist[7] and later Ketron[8] laid stress on the Bacillus acnes; Whitfield[9] emphasized the importance of gastro-intestinal disturbances.

On clinical grounds it has long been suspected that acne vulgaris is caused by some endocrine disturbance, presumably by disturbance of the gonads, and many observers have commented on it. Thus Hollander[10] was impressed with the correctness of the conception that the underlying etiologic factor in acne is somewhere in the domain of the endocrine glands, probably the gonads. According to Schamberg,[11] when the phenomenon of the relapse during menstruation in persons with acne is considered in conjunction with the initial onset of acne at the approach of puberty the inference appears to be justified that an internal secretion from the sex glands plays an important role. Darier[12] stated that localized acne of the chin in young women is supposed, almost certainly, to indicate utero-ovarian trouble.

Cunningham and Luntsford[13] conducted an interesting investigation among women college students, comparing 2,974 girls with acne, with 3,185 who did not have acne as controls. No difference was found in respect to the incidence of common disorders, such as constipation, incidence of colds, state of nutrition as expressed by weight or conditions of the nose and throat, to which a contributory influence on acne is usually ascribed. No relationship between the presence or absence of acne in the 15-34 year age group, and such menstrual characteristics as age of onset, duration, irregularity in interval, amount of pain and amount of flow was demonstrated; thyroid enlargements were found to be associated with a slight increase in acne incidence. In connection with this last finding, it is of interest to note the possibility expressed by Sulzberger[14] and his co-workers, that increased thyroid activity, frequently coincidental with increased gonad activity and leading to increase in circulating thyroxin (the iodine-containing hormone), might explain acne vulgaris as essentially of the same nature as a very chronic iodide acne. Attempts to prove this experimentally by means of thyroxin patch tests did not, however, lend strength to this possibility.

The work of Stokes and King,[15] in demonstrating that there is a familial and heritable element in predisposition to acne vulgaris is significant, and important in prognosis and treatment.

The late Bruno Bloch[4] called acne, among other diseases, a dyshormonal dermatosis. He noted the fact that eunuchs are said to be immune from acne, and that there have been pathologic cases in which acne appeared in the first years of life when (owing to supra-renal tumor) sexual maturity was precociously developed. In a series of interesting tables and graphs showing the correlation of acne, on one hand, and the commencement of the menses and the appearance of pubic and axillary hair, on the other, he demonstrated clearly that in any age group those sexually developed show a higher percentage of acne than those not sexually developed.

It was Bloch's opinion that acne in its first phase is a consequence of the physiological function of the sex glands, analogous to that which we in general assume for the development of the normal secondary sexual features, such as the formation of terminal hair. The degree of their formation is undoubtedly different. This may be dependent on the fact that the production of sex hormone is varied in strength in each individual, or (and this seems more likely) that the follicular apparatus of the skin (the receptor mechanism) is individually different in its sensibility to this hormone (as for example the type of beard varies in different men). As a result we are faced by the fact that in acne the normal physiological action of a ductless gland—the sex gland—in the skins leads through transition stages to a final effect which is pathological—a real lesion of the skin, namely acne.

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*From the Department of Dermatology, Vanderbilt Clinic College of Physicians and Surgeons, Columbia University. Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, Dec. 27, 1935.

Etiology—Clinical Investigations

A large amount of circumstantial evidence, clinical intuition and conjecture implicating the sex glands in the etiology of acne has thus been accumulated, but until recently there was no means of demonstrating exactly the variations from the normal of the function of any sex gland. The newer knowledge of ovarian function, however, has provided a fairly precise method for determining the excretion of estrogenic substance in blood and urine, both qualitatively and quantitatively.

This was initiated by the studies of Stockard and Papanicolaou,[16] Evans and Long,[17] and Allen,[18] and depends on the fact that synchronously with the cyclical changes that take place in the ovaries, there occurs a cyclical change in the uterus and vagina of the animals used, and that the vaginal secretions partake of this change. The estrogenic substance is concentrated by lipoid extraction of the blood or urine. It is unnecessary here to go into detail regarding the principles and technic of its isolation and recognition. In our work the method described by Kurzrok and Ratner[19] was used for extracting the hormone from the urine, and that of Frank and Goldberger[20] for extraction from the blood. The vaginal spread of the castrated rat is used as indicator.

For the sake of completeness, although the author has had no experience with it, some mention will be made of the testis hormone. This was recognized by McGee[21] in 1927 in lipoid extracts of the testes. The test for the testis hormone is not as clearly defined, and is slower than that for estrogenic hormone in the female, and is accomplished by means of the capon test (comb, wattles and spurs).

It is important at this juncture, to emphasize the discovery by Smith,[22] and shortly after by Zondek and Ascheim,[23] that both ovary and testis remain dormant unless stimulated by the secretion of the adenohypophysis (anterior pituitary or prepituitary gland) and that this gonadotropic factor activates alike the gonads of both sexes.

It was thought that evidence of normality of ovarian function would be indicated by a study of the excretion of estrogenic substance in the urine and blood of patients with acne. Kurzrok's[24] studies have shown that normal women between the ages of sex maturity and the menopause excrete from ten to twenty rat units of estrogenic substance per liter of urine throughout the menstrual cycle.

The urines of thirty-four young women who applied to the Vanderbilt Clinic for treatment of acne were examined. The age range was eleven to thirty-three years, twenty-one being under twenty years of age.

The results were as follows:

	No. of Patients	
Strongly positive reaction (10-20 rat units)	6	
Slightly positive (4 rat units)	1	82%
Negative reaction	27	

In the blood the work of Frank and his associates[25] tends to show that in the normal fertile menstruating woman the concentration of estrogenic substance undergoes regular cyclic variations, and also that the renal permeability of these substances varies in the individual. In view of these possibilities it seemed desirable to repeat the above observations, estimating premenstrual values for estrogenic substance in the blood of patients with acne.

In normal fertile menstruating women Frank and Goldberger found one mouse unit of estrogenic substance in forty cubic centimeters of blood taken from the tenth to the third day premenstrually in forty-four per cent of their patients, while from the third to the first day premenstrually at least one mouse unit was present in the blood of one hundred per cent of the patients. (Average for the entire period seventy-two per cent.) Neustaedter[26] found estrogenic substances in the blood of seventy-five per cent of his patients in a similar interval; Mazer and Goldstein[27] found the percentage slightly higher in their series (eighty-five per cent).

With these figures representing average norms, we may compare them with the findings in normal menstruating women with acne. Twenty-nine consecutive patients with acne with normal menstrual histories were examined. In none of the patients studied were any other acne-producing factors, dietetic or chemical, detected. Their ages ranged from eleven and one-half years to thirty-four years, and the menstrual interval ranged from twenty-one to thirty-one days. Forty cubic centimeters of venous blood obtained within seven days of menstruation was assayed for estrogenic substance by the method of Frank and Goldberger.

The results were as follows:

	No. of Patients	
Strongly positive reaction (one mouse unit)	2	
Weakly positive (less than one mouse unit)	16	93%
Negative reaction	11	

Results of Treatment

Van Studdiford[28] treated a number of female patients with acne with a variety of endocrine products. He administered dessicated ovarian extract, in the early days before the appearance of the more refined commercial glandular products, and also used orchic extract. More recently, fifteen patients were treated with estrogenic substance, three doses being given by injection on alternate days one week premenstrually. Of these patients, eleven improved. Sixteen patients in another series were treated by a combined method, consisting of the injection of a preparation of the gonadotropic substance postmenstrually, as a stimulative measure, followed by the injection of estrogenic substance premenstrually, as a substitutional measure. Eight of the patients treated in this manner showed improvement.

Michael,[29] working in co-operation with gynecologists in order to employ the newer endocrine products in the most suitable manner, treated twenty-six acne patients with hormone therapy. The therapeutic results were poor, and discouraging so far as the influence of the hormone treatment on the acne was concerned.

Lawrence and Feigenbaum[30] treated six males and eight females with pregnancy urine extract, with results sufficiently satisfactory to warrant further study.

The patients in my series number thirty-eight females and two males, practically all of whom were followed for almost two years. The ages of the female patients ranged from thirteen to thirty-three years, the average age being nineteen and eight-tenths years. Physical examination, apart from the presence of acne vulgaris, was essentially negative in all, except for two patients who had arrested stages of pulmonary tuberculosis. One patient showed a basal metabolism rate of plus thirty-five per cent, although there were no clinical signs of hyperthyroidism. Seven of the patients were married.

An analysis of the menstrual histories of the patients studied failed to reveal any relation between the acne and any particular menstrual characteristic. A number of the patients reported premenstrual aggravation of the eruption, while a few thought that the eruption was better at that time.

Treatment consisted of five injections of one cubic centimeter each, of a preparation of estrogenic substance (fifty rat units) given at daily intervals, followed by the same number and dosage of a pregnancy urine preparation (containing one hundred rat units to each cubic centimeter) instituted post-menstrually. This amount of treatment was termed one course. After the next period, a similar course of treatment was administered. During this time no local applications or treatments were given.

The two male patients, aged seventeen and eighteen years respectively, were given one cubic centimeter of pregnancy urine extract three times weekly for several weeks; one made a speedy and complete recovery, while the other showed no improvement at all.

The results of treatment of the female patients are as follows:

	No. of Patients	Aver. No. of courses per patient
Definitely improved	13	2.3
Slightly improved	10	1.8
No improvement	15	1.4

In connection with this type of therapy, it may be pertinent to call attention to the possible ill effects attending prolonged treatment with estrogenic substances. Kunde et al[31] in 1930 showed that continued high dosage of estrogenic substances has a distinctly sclerosing effect on the ovaries. Numerous reports have also appeared relating to the carcinogenic properties of estrogenic substances; one observer[32] states that mammary cancer developed in male mice following treatment with these substances; others[33] saw atypical growths, resembling cancerous changes in the uterine cervix of monkeys after prolonged treatment.

Comment

The treatment of acne is still a therapeutic problem, mainly as a result of uncertainty as to its cause; roentgen therapy, formerly regarded as a specific, has not proven completely satisfactory in all cases. It is believed that on the basis of the foregoing investigations one may assume that a definite relationship exists between the estrogenic hormone and acne, and that a deficient secretion of this hormone may prove to be the direct or indirect factor in the causation of one type of acne. While it is known that the anterior pituitary gland governs or regulates gonadal activity, no information is available as to the apparent dysfunction, if any, in the link between it and the ovary. In this connection a possible, although very remote explanation of part of the mechanism of roentgen irradiation may be attempted. It is conceivable that, in the course of routine filtered roentgen therapy for acne, the pituitary gland is affected by the irradiation administered, and in consequence induces a normal gonadal response.[34]

The evidence is strong then, that acne is caused by disturbance in the sex endocrines. Just what that disturbance is, or how it acts, is not clear. Endocrine therapy for acne is not yet reliable because we do not know the best preparations to use, or how best to administer them. At the same time, in addition to any so-called specific treatment, an appreciation of the secondary factors involved in the management of any acne patient is very important.

Altho beyond the scope of this paper, brief mention will be made of them.[35] The most obvious is the correction of any abnormalities in the general physical condition of the patient. overcoming constipation, controlling infections and bringing the weight either up or down to normal. The regulation of digestive disturbances, with emphasis on a balanced diet and the correction of personal food fads is usually needed. It is a clinical observation that chocolate, in any form, may produce new outbreaks, or aggravate existing acne lesions, in some individuals. White bread, particularly in large cities, contains potassium bromate introduced as a riser, which, in baking is reduced to the bromide. This of course must be eliminated.

At the same time a careful search for iodides and bromides in food or incidental medication must be made. The most frequent offender is iodized salt. Lastly, regulation of personal habits and hygiene to ensure the proper amount of rest, exercise, fresh air and sunlight are imperative.

Conclusion

Estimation of estrogenic substance in the urine and in the blood in two independent series of females with acne yielded parallel results:

Eighty-two per cent of patients showed absence or subnormal quantity in the urine;

Ninety-three per cent of patients showed absence or subnormal quantity in the blood.

This leads to the belief that associated with acne there is abnormality of formation or of utilization of the sex hormone. The exact nature of this aberration and the direction it takes are unknown. It is as yet undetermined whether lack of estrogenic substance or some other basic fault is the cause of acne.

Treatment of these patients with preparations of estrogenic substance and gonadotropic substance produced some favorable results (60 per cent improvement).

Prolonged treatment with estrogenic substances is not without danger; sclerosis of the ovaries, and carcinogenesis have been reported.

The basic principles underlying the general management of patients with acne must not be overlooked, regardless of what specific therapy may be employed.

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Trends of Modern Diagnosis As Related to Medical Specialism*

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THIS interesting occasion marks an important milestone in the life of this institution. The Nicollet Clinic is representative of the highest purposes of group practice and offers an illustration of professional association with equality of personnel that permits a coordination of diagnostic procedure and consulting judgment not possible in individual practice. It is gratifying to note that with such an organization the traditional relationship of physician to patient has always been maintained.

The trends of modern diagnostic methods are significant of the remarkable advancement of knowledge in every field of medicine since the opening of the century. Knowledge has been compared to an island surrounded by a body of unknown waters. It will be generally admitted that the shore line of medical knowledge has been extended into the unknown, perhaps, farther than in any other branch of learning.

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*Presented at a Dinner Commemorating the Fifteenth Anniversary of the Establishment of the Nicollet Clinic, Minneapolis. January 25, 1936.

It is possible only to present in brief outline the degree to which diagnostic methods have been extended in every form of medical and surgical practice.

Roentgenology has contributed so much towards the visualization of the viscera and the solid organs, such as stereoscopic roentgenograms of the head and thorax; ventriculograms and encephalograms; the use of contrast media in fluoroscopy and X-ray films of the gastro-intestinal tract; the Graham-Cole method of visualizing the gall bladder and contents, and the remarkable contributions of excretory urography and intravenous pyelography. It is possible to visualize solid organs like the liver and lymph nodes by the use of preparations of thorium salts. Lymph vessels as well as blood vessels have likewise been visualized. Roentgenograms following injection of iodine suspended in a vegetable oil, can make the bronchial tree and nasal accessory sinuses clearly visible. Pneumo peritoneum with peritoneoscopy present distinct possibilities in the diagnosis of of intra abdominal conditions. Direct illumination of internal structures has been further facilitated by the use of the ophthalmoscope, otoscope, laryngoscope, esophagoscope, bronchoscope, gastroscope, proctoscope and the endoscope.

Clinical laboratory examinations of the various secretions and excretions of the body as well as pathological exudates and transudates have become of increasing importance in the diagnosis of many disease conditions.

Immunologic and allergic reactions have formed the basis for a large number of sensitizing and diagnostic tests of great value. The Zondeck test and its several modifications has an important part in the earlier recognition of the pregnant state. The dark field illumination of the spirochaeta pallida in the initial lesions of syphilis and the complement fixation tests of Wassermann and Kahn in blood serum and cerebro-spinal fluid in the later states of the disease are essential for confirmatory purpose in the diagnosis of all syphilitic infections.

The several renal function tests as well as those of liver function and the Icterus-index determination are all recognized as having definite diagnostic value.

Blood chemistry has become an essential diagnostic aid in nephritis, diabetes, endocrine diseases and other nutritive disorders.

In view of the valuable contributions of Downey, Giffin, Watkins and other Minnesota investigators it seems hardly necessary to refer to the newer knowledge regarding blood formation, and the importance of the reticulo-endothelial system as a basis for a better recognition of the leukemias, anemias, and the so-called reticulo-endothelioses.

The historical development of our knowledge of the circulatory system, and the diagnosis of heart disease constitutes the most consequential episode in the general development of medicine. Beginning with the heroic figure of Vesalius and his school of anatomy at the University of Padua in the sixteenth century from which came our first knowledge of the anatomic structure of the heart, and the larger blood vessels, stimulated the epoch-making discovery of the circulation by William Harvey in 1616. It is interesting to note that the mechanism of events of the heart's cycle as demonstrated by Harvey have remained unchanged after more than three hundred years of critical study. More than a century later came the discovery of thoracic percussion by Auenbrugger, and in 1819 the name of Laennec was immortalized by the invention of the stethoscope and the discovery of mediate auscultation. It is well said that Laennec with his stethoscope, and the study of disease at the bedside and in the post-mortem room practically created clinical medicine as we know it today. As its immediate outcome appeared the leaders of the Irish school Stokes, Cheyne, Adams, and Corrigan, each name being associated with a new clinical observation of diagnostic importance in heart disease. In the Vienna school the brilliant internist Skoda, and later Bamberger made many distinct contributions to the recognition of heart disease.

Graphic methods for demonstrating the physiology of the heart's action had their origin in the laboratory of Carl Ludwig who is often referred to as the greatest teacher of physiology of all time. The Dudgeon sphygmograph was the outcome of these studies, and in the graphic demonstration of the various pulse changes the greatest credit is due to that brilliant general practitioner Sir James Mackenzie. A woman patient in labor died suddenly of heart failure. This led him to studying the circulatory condition of all women before, during, and after pregnancy. He soon recognized two types of pulse irregularities, dangerous and non-dangerous. Mackenzie was the first to describe auricular fibrillation. He noted further, that digitalis slowed the fibrillation and relieved the decompensation. By means of the ink polygraph that bears his name he was able to make simultaneous tracings of the jugular venous pulse, the carotid pulse, and the apex beat of the heart.

The work of Mackenzie on the "study of the pulse," and later amplified by his disciple Sir Thomas Lewis have made it possible today to recognize and interpret the various types of pulse irregularities practically without instrumental aids.

The development of clinical sphygmomanometry had its beginning with the demonstration of the English Rector Hales in 1731, "to determine the arterial blood pressure in horses by observing the height to which the blood columns ascended." It is a far cry from that early demonstration to the development of the comfortable and compact sphygmomanometers of the present day. The measurement of arterial blood pressure has now become a routine part of every physical examination, and has often revealed evident cardiac enlargement and heart failure not previously recognized.

In 1903 Einthoven introduced the string galvanometer to the scientific world. In 1906 the electrocardiograph was first introduced by Sir Thomas Lewis into hospital service in London, and thus clinical electrocardiography had its beginning. This ushered in a new era in the diagnosis of heart disease, and particularly in the differentiation and interpretation of the arrhythmias as well as the newer knowledge of coronary artery and myocardial disease.

The classic contribution of James B. Herrick on coronary thrombosis in 1912, and that of other American clinicians has added a new chapter to internal medicine, and a clinical picture or syndrome was developed that is now readily recognized at the bedside.

It would require more time than is available to discuss the remarkable degree of certainty that has developed in the diagnosis of tumors of the brain and spinal cord. The role of the autonomic nervous system in the production of pain and other clinical symptoms, singly or in combination, is recognized as an important factor in diagnosis.

In the field of endocrinology the physiologic changes in hormonic action have added to our diagnostic problems, and in consequence many new clinical pictures or syndromes are to be considered. Disease conditions producing an increase or diminution of the function of a particular endocrine organ are constantly enlarging our clinical nomenclature. Recent observations regarding the hormonic action of neoplasms will tend to disprove the older concepts that tumor cells are purely parasitic and non-functional. These deal mainly with the possible hormone effects of certain gonadal tumors, more particularly, of the ovary, and also tumors of the pituitary, parathyroid and adrenal cortex.

The ovarian tumors are associated with secondary sex changes, being of two classes: (a) granulosa cell tumors, and (b) arrhenoblastomas. The hormone effects produced by the granulosa cell tumors are along the line of feminization, with over accentuation of certain female sex characters and functions. The arrhenoblastomas have their histogenesis in certain undifferentiated cells persisting in the rate and capable of later function along either male or female lines. These tumors produce effects on the sex characters along opposite lines, in that they tend toward a defeminization and masculinization of the individual. Removal of these tumors has usually brought about a regression of the clinical symptoms.

Reference should be made to the obvious functional role of the cells of the acidophilic pituitary adenomas in the production of acromegaly or gigantism and particularly, the interesting syndrome reported by Cushing associated with basophil adenomas of the pituitary body.

Pituitary adenomas, according to Cushing, are of three principal varieties, neutrophil, acidophil, and basophil, but no constitutional disorder has been definitely ascribed to the basophil variety.

The polyglandular syndrome, formerly supposed to be of cortico-adrenal origin, is characterized in its full-blown state by acute phethoric adiposity, by genital dystrophy, by osteoporosis and by vascular hypertension. At autopsy in six out of eight instances observed by Cushing it was associated with a pituitary adenoma, and in three of the most carefully studied cases it was definitely shown to be composed of basophil elements, the lesion in one instance having been clinically predicted before its post-mortem verification.

A further evidence that tumors may possess function is furnished by the studies in recent years of Wilder and others of parathyroidism, in which adenomas of the parathyroid are definitely related to multiple cystic and giant cell tumors of the bone, this evidently being one of the expressions of exaggerated parathyroid activity. When the parathyroid adenomas are removed, a regression takes place in the bone tumors.

That modern diagnostic technique is based on special training is obvious, and its influence towards specialized medical and surgical practice is likewise apparent.

In the evolution of American medical schools during the past three decades uniformity of curriculum and hours of study constituted all too frequently the principle standard of measurement; courses in certain specialties occupied a large part of the undergraduate curriculum. This was reflected in the increasing number of medical graduates taking up one or the other of the specialties, directly upon admission to practice. The studies of Weiskotten indicate that an average of ten per cent of recent graduates entered the field of specialized practice in 1910, and this rose to the unusual figure of thirty-five per cent in 1930. This state of affairs became a matter of considerable concern to medical educators, and the profession generally recognized the inherent dangers of this large influx of incompletely prepared specialists in the different fields.

In certain of the European countries legal provisions control the licensure of specialists, but such measures did not seem practicable for the country. In the many discussions on the subject the concensus of opinion placed the responsibility on the organized medical profession as represented by the American Medical Association, and further that any form of legislative control was undesirable.

It is to the credit of special societies in the two head specialties in taking the initiative and pointing the way for the formation of qualifying and certifying boards in the different medical specialties. The American Board of Ophthalmology was organized in 1916 and has been certifying specialists in ophthalmology ever since. The American Board of Otolaryngology was formed in 1923, the American Board of Obstetrics and Gynecology in 1927, and the American Board of Dermatology and Syphilology in 1929.

As other specialties began to take steps towards forming similar qualifying boards, the need was recognized for some central agency or supervising body such as the Council on Medical Education and Hospitals of the American Medical Association, for the purpose of co-ordinating graduate education and the certification of specialists in the United States and Canada.

At the Milwaukee session of the American Medical Association in 1933 a resolution was adopted by the House of Delegates authorizing the Council on Medical Education and Hospitals to formulate standards of administration in general based upon those of the four specialty boards previously organized, and to recognize new boards meeting these standards.

To avoid duplication of effort as well as to co-ordinate the work of the several Boards, and other interested groups it was deemed advisable to create an Advisory Board for Medical Specialties which should be representative of each organization concerned. This Advisory Board began to function in February, 1934. Since that time the American Board of Pediatrics, the American Board of Psychiatry and Neurology, the American Board of Radiology, the American Board of Orthopedic Surgery, and the American Board of Urology have been properly organized, approved and elected to membership by the Advisory Board, and recommended to the Council on Medical Education and Hospitals of the American Medical Association for official recognition.

Each of the nine specialty boards which have been organized comprise in their membership representatives from the two special Associations, and from the section of the particular specialty in the American Medical Association.

During the past year the formation of certifying boards in the two larger specialties of internal medicine and surgery has been making rapid progress. The American Board of Internal Medicine has practically completed its organization and will present its application for official recognition by the Advisory Board and the Council on Medical Education and Hospitals of the American Medical Association at the meeting of these two bodies in Chicago on February 16, 1936. The American Board of Internal Medicine will be composed of five members representing the American College of Physicians, Jonathan C. Meakins, Montreal; O. H. Perry Pepper, Philadelphia; David P. Barr, St. Louis; William S. Middleton, Madison, and G. Gill Richards, Salt Lake City, and four members, John H. Musser, New Orleans; Ernest E. Irons, Chicago; Reginald Fitz, Boston, and Walter L. Bierring, Des Moines, from the section on practice of medicine of the American Medical Association. Candidates for certification will be required to furnish evidence of seven years of special training before being admitted to the final written and practical examination. This Board expects to begin operations by January 1, 1937.

The American Board of Surgery as well as the American Board of Pathology are in process of organization and will no doubt be completed this year.

Thus it has come to pass that the medical profession of America has solved another of its important problems. There will be fewer medical specialists in the future, but they will deserve the designation for having passed the scrutiny of their peers.

This great accomplishment brings more clearly into the foreground the equally important responsibility of the educational forces and the organized medical profession of the training of that general practitioner or family doctor who is to care for eighty-five per cent of general medical practice. It is for this "basic" doctor that medical faculties are enlarged, physical equipment is constantly extended, and every facility for fundamental training is developed.

This general practitioner and cultured physician with the highly qualified specialist will be the medical pioneers of tomorrow, and we have every confidence that the finest traditions of our Guild will be preserved.

In conclusion I wish to express my sincere appreciation for the courtesy of this invitation and congratulations to the staff of the Nicollet Clinic for their influence in extending the higher ideals of medical practice in this community.

BOOK NOTICE

POPULAR CHEMISTRY

Out of the Test Tube, by HARRY N. HOLMES, B.S., M.S., Ph.D.; first edition, heavy green cloth, gold-stamped, 373 pages, numerous illustrations; New York: Emerson Books, Inc.: 1935. Price, $3.00.

It is not easy to write an accurate yet enthusiastic book on scientific research for a lay audience, yet Dr. Holmes, who is professor of chemistry at Oberlin College, Oberlin, Ohio, has managed to combine both verity and warmth in this volume.

The work is not technical, nor does it entertain such pretensions. The text in the main is almost elementary. It had to be so, because the nature of the chemical processes mentioned is too abstruse when fully described. A more extensive explanation of the subject by Professor Holmes would have rendered the volume tedious to the ordinary reader, thus defeating its own purpose.

As an instructive, but not exhaustive, text for the general reader, this volume is recommended by The Journal-Lancet.

ARTHRITIS TEXT FOR LAYMEN

Arthritis and Rheumatic Disease, by MAURICE F. LAUTMAN, M.D., with a foreword by MORRIS FISHBEIN, M.D.; first edition, 173 pages, no illustrations, bright green cloth, gold-stamped; New York City: The McGraw-Hill Book Company: 1936. Price, $2.00.

This is the second volume of the Whittlesey House Home Health series, the first being *Healthful Living*, by Harold S. Diehl, M.D., dean of medical sciences at the University of Minnesota, and a member of The Journal-Lancet's editorial board.

Dr. Lautman is director of the department for the study of arthritis at the Levi Memorial Hospital in Hot Springs, Arkansas; and is consultant to the United States Public Health Service Clinic.

The book is authoritative and sound, and may be recommended to any patient. Needless to say, a work of this kind contains no new clinical advances, and no startling experimental work. Such is not its purpose.

Arthritic patients will benefit from the advice proffered in this book, and in such manner, it may prove of definite value to many.

NAUPATHIA HANDBOOK

Why Bring That Up? by J. F. MONTAGUE, M.D.; first edition, green cloth, gold-stamped, 131 pages, illustrated; New York: The Home Health Library, Inc.: 1936. Price, $2.00.

Dr. Montague is editor of the monthly periodical called *Health Digest*, which is addressed to the lay reader. The motto of the Home Health Library, Inc., which publishes this book, is the anachronistic phrase, "There's a cure for every ill." Whether Dr. Montague can produce an absolute preventive for naupathia is beside the point; he does manage to present common-sense arguments in favor of accepted procedures for relieving the sea-sick ocean traveller. The book is pleasingly-produced and is well-illustrated. Probably the publishers selected the green-tinted text paper with their tongues in their cheeks.

GEOGRAPHICAL ORIGIN OF SYPHILIS

The Gift of Columbus, by CHARLES C. DENNIE, M.D.; first edition, 195 pages, no illustrations, heavy red cloth, gold-stamped; Kansas City, Missouri: The Brown-White Company: 1936. Price, $2.00, postpaid.

The author is a Kansas City practitioner who evidently does not agree with the mass of evidence produced by Pusey *et al.*, to wit: that syphilis probably had its origin on the North American continent, and was carried to Europe by fifteenth and sixteenth century explorers and navigators. He believes, with Ales Hrdlicka, M.D., that Columbus brought this disease to America, and he states that "the Neapolitan Disease" was known to physicians even before Columbus sailed to America. The obvious answer, to Dr. Dennie, is that Columbus could not have brought syphilis from the New World to Europe; he must have carried it *from* Europe *to* the New World. The author's premises are interesting, but he gives very few references, and his statements on the whole are not documented.

BERENS' TEXT ON THE EYE

The Eye and Its Diseases, edited by CONRAD BERENS, M.D.; first edition, 1,254 pages, 436 illustrations, heavy cloth, gold-stamped; Philadelphia: The W. B. Saunders Company: 1936. Price, $12.00.

It should be noted that Dr. Berens, who is director of research for the New York Eye and Ear Infirmary in New York City, is the editor, rather than the author of this work. Eighty-two international authorities have presented their ideas on the particular aspect of ophthalmology in which they are best qualified to write. These different articles—often more like abstracts—quite completely cover the entire field of ophthalmology, from the history of the subject by Dr. Thomas Hall Shastid of Duluth, Minnesota, to the proper pathological technic in preparing specimens.

R. Foster Moore, M.D., discusses medical ophthalmology, and includes illustrations from his well-known book on the same subject. Other contributors are Humphrey Neame, the British ophthalmologist; and Lewis H. Carris, managing director of the National Society for the Prevention of Blindness.

There may be some confusion, due to the arrangement of the book. For example, diseases of the crystalline lens are discussed by one author, and in a separate chapter the operation for cataract is treated by another author. Both discuss the same subject.

But that is a minor criticism. In general, the book will be useful to all medical men interested in ophthalmology, from student to specialist.

Kenneth A. Phelps, M.D.,
University of Minnesota.

The JOURNAL LANCET

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South Dakota State Medical Association
Montana State Medical Association
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The Minnesota Academy of Medicine
The Sioux Valley Medical Association
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A DERMATOLOGIC SYMPOSIUM

This issue of THE JOURNAL-LANCET contains 12 papers on dermatologic and syphilologic problems which confront the physician in his daily work. The articles represent a co-operative effort by the departments of dermatology of the University of Minnesota and The Mayo Clinic.

There has been a steady increase in America in the number of reports of co-operative studies that have appeared in the medical literature during the past few years. This tendency seems indicative of two facts: (1) that the medical profession is apparently impressed by the results of the thorough study of large series of cases by a group of physicians; (2) that the members participating in the work not only gain material knowledge from their efforts but have the additional advantage of bartering ideas with their colleagues across the work table. The physician who is devoting all of his time to one branch of medicine needs this type of contact with his confreres. Dermatologists are rather proud, and rightly so, of the fact that they continue to foster co-operative efforts of this type.

PAUL A. O'LEARY, M.D.

CERTIFICATION OF SPECIALISTS IN INTERNAL MEDICINE

The *Journal* of the American Medical Association for August first published an announcement of the final steps in the movement for certification of specialists in internal medicine. This move was initiated by the Regents of the American College of Physicians at the Philadelphia session in 1935, when they adopted a resolution to underwrite the necessary expense and join with the Section on Practice of Medicine of the American Medical Association in the organization of the American Board of Internal Medicine, which will function in the United States and Canada.

The purpose of the board is to certify specialists in internal medicine and establish proper qualifications, together with the required examination procedure, for certification. Since the establishment of the first board for certification of specialists in any field twenty years ago, many boards have been established. The first of these was in ophthalmology, and gradually other boards have been formed almost entirely in limited surgical fields. The anatomical limitations have seemed to justify this narrow specialization in surgery, but in internal medicine the prime need is for breadth of view and completeness of understanding of the entire body and its functions. Because of this need, the establishment of this board, which shall certify for specialists in internal medicine as a whole, is of historic importance. After July first, 1937, this board will inaugurate similar qualifications and procedures for additional certification in certain of the specialized branches of internal medicine, such as gastroenterology, cardiology, allergy, metabolic diseases and tuberculosis; but certification in the broad field of internal medicine will be required first. Doubtless participation and coöperation of representatives from each of these narrower fields in medicine will be forthcoming.

The purpose of these boards is not primarily to certify competence in the fields under consideration, but to certify men qualified as specialists and consultants. Since the movement will eventually provide that only men certified by the corresponding boards will be listed in the *Directory* of the American Medical Association as qualified specialists, this means a distinct step in advance in medical organization as it will eliminate the self-nomination of specialists in this only official list of men properly qualified.

S. M. W.

THE AGE OF INDISCRETION

Venereal diseases are not deliberately contracted. They are the incidental and unfortunate by-products of a deep seated creative urge, an instinct so strong that it baffles codes and spurns conventions in its primary and essential purpose of propagating, preserving and perpetuating the human race.

Wise parents admonish their children of the dangers that confront them with the advent of puberty when this new force fraught with such tremendous responsibility is suddenly thrust upon them as the crowning test of adult character, good judgment and proper restraint. Love's awakening has ever been a favorite theme of song and story, in spite of such portentous lines as "*Werst nicht glaubt der wird erfahren was die lieb für kummer macht.*"

With its decadence the song is different and the refrain of every story: "No fool like an old fool." Galsworthy in THE FORSYTHE SAGA referred to this period in Soame's life as his Indian summer. More charity than poetry in that. When prostatic pressure asserts itself in men and certain embarrassing consequences are no longer feared by women, erratic acts, erotic emotions and neurotic behaviors frequently manifest themselves and there is little wonder that the consequences should at times prove disastrous. When the old folks come in with recently contracted diseases that are incidental to the abandon that often accompanies this *age of indiscretion*, let us remember that there may be a physiological reason for their antics. Nature rarely gives up the ghost without a final death struggle.

A. E. H.

ARE PHYSICIANS EDUCATED?

About a decade ago A. E. Wiggam published an article under the title of "The Ten Marks of An Educated Man," which are as follows:

"1. He keeps his mind open on every question until the evidence is all in.
2. He always listens to the man who knows.
3. He never laughs at new ideas.
4. He cross-examines his day-dreams.
5. He knows his strong point and plays it.
6. He knows the value of good habits and how to form them.
7. He knows when not to think, and when to call in the expert to think for him.
8. You can't sell him magic.
9. He lives the forward-looking, outward-looking life.
10. He cultivates a love of the beautiful."

There are few persons living in any community today who have had greater opportunities to become truly educated than the physician. Most physicians have taken advantage of their opportunities. However, from Mr. Wiggam's remarks, it is obvious that one may have spent long hours in colleges and universities without having become truly educated.

Although all of these ten marks are significant, two deserve special mention. First, "He keeps his mind open on every question until the evidence is all in." This sometimes is difficult, particularly in diagnostic work, but it seems to be more difficult in dealing with the work of fellow physicians. How often one sees bitterness develop among physicians as a result of failure to obtain all the evidence before forming an opinion. Such bitterness is said to be common in small communities but, unfortunately, it is also observed in large cities, where it may not be so noticeable, simply because a very small percentage of the persons in the community have an opportunity to know about it. If every physician could keep an open mind on all subjects, better medicine would be practiced because of better co-operation with fellow physicians, and the public would have a better opinion of our profession. Osler said: "Strife seems rather to be the very life of the practitioner, whose warfare is incessant against disease and against ignorance and prejudice, and, sad to have to admit he too often lets his angry passions rise against his professional brother." Again he said, "But in too many towns and smaller communities miserable factions prevail, and bickerings and jealousies mar the dignity and usefulness of the profession."

The second mark of an educated man in Mr. Wiggam's list, which seems especially significant is, "He never laughs at new ideas." The physician whose mind is open will listen to new ideas, obtain all the evidence available, and then carefully weigh the evidence. He will keep an open ear and an open mind for further evidence, which may influence even his best considered opinion.

There are numerous lessons in medical history to convince us that the men with new ideas, no matter how strange they have seemed, have often been the men who have made the greatest contributions to our knowledge of medicine. Pasteur's colleagues laughed heartily at his ideas. They seemed to be in reverse; that is, his ideas were traveling against the current opinions of the day, but history records the outcome of Pasteur's ideas, and has forgotten those who laughed at him.

J. A. M.

RICHARD OLDING BEARD, M.D.

Dr. Richard Olding Beard was born December 20, 1856, in Tollington Park, Middlesex, England, and died August 14, 1936, at his home in Minneapolis, Minnesota.

He came with his family to America in 1869, settling first in Chicago. Graduated in medicine at the Northwestern University Medical School in 1882, he came at once to Minneapolis, Minnesota, where he was engaged in active practice of medicine until 1900, and was assistant commissioner of health from 1886 to 1889.

Dr. Beard was one of the founders of the Medical School of the University of Minnesota in 1888, and took an active part with Dean F. F. Wesbrook in the movement which resulted in the unification of medical teaching in the state at the University of Minnesota in 1908. He was secretary of the University of Minnesota Medical School from 1888 to 1903 and from 1906 to 1925, and director of the department of Physiology from 1888 to 1912. Holding the Professorship of physiology, University of Minnesota, from 1888 to 1925, he retired from active teaching in 1925, becoming emeritus professor.

He founded the School of Nursing of the University of Minnesota in 1909—the first university nursing school—and organized the Central School of Nursing at the University of Minnesota in 1921, uniting the nursing services of four major hospitals with the School. He also initiated movements to establish endowment funds for the Nursing and Medical Schools of the University of Minnesota.

Upon retirement from active duty in the University of Minnesota Medical School, he was engaged in the direction of public health work, serving as executive secretary of the Health Council of the City of Minneapolis and the County of Hennepin from 1925 to 1932. Upon retirement in 1932 from public health work, he devoted himself to literary work. At the time of his death he was writing a history of the Mayo Clinic.

During his active life of service he wrote numerous articles for various journals, and gave addresses on medical and nursing education and in public health interests in thirty-four states of the Union.

He was a member of Alpha Kappa Kappa fraternity; honorary member of Hennepin County Medical Society, Minnesota State Medical Association, State Organization of Public Health Nursing; fellow of the American Medical Association and the American Public Health Association; member of American Hospital Association; honorary fellow (formerly secretary, vice-president and president) of the Minnesota Academy of Medicine; and an honorary member of National League of Nursing Education.

Survivors are his wife, Theresa V. Beard; two daughters, Mrs. Rachel B. Thomson, Baltimore, Maryland, and Mrs. Henry Steffens, Asheville, North Carolina; two grandsons, Richard B. Thomson and William Steffens; two sisters, Miss Frederica and Miss Margaret Beard, of Oak Park, Illinois; and a brother, Harington Beard, of Minneapolis.

S. M. W.

SOCIETIES

PROGRAM

INTERNATIONAL MEDICAL ASSEMBLY INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

October 12, 13, 14, 15, 16, 1936

Pre-Assembly Clinics, October 10
Post-Assembly Clinics, October 17
St. Paul Hospitals

ST. PAUL, MINN.

MONDAY, OCTOBER 12
8:00 A. M.

Diagnostic Clinic: "Coronary Thrombosis and Angina Pectoris"—Dr. Fred M. Smith, Professor of Theory and Practice of Medicine, State University of Iowa College of Medicine, Iowa City, Iowa.

Diagnostic Clinic: "Diseases of the Thyroid Gland"—Dr. Robert S. Dinsmore, Cleveland Clinic, Cleveland.

Diagnostic Clinic: "Rheumatoid Arthritis"—Rr. Russell L. Haden, Chief of Medical Division, Cleveland Clinic, Cleveland.

Intermission for Review of Exhibits

Diagnostic Clinic: "Trigeminal Neuralgia"—Dr. Francis C. Grant, Assistant Professor of Neurological Surgery, University of Pennsylvania School of Medicine, Philadelphia.

Diagnostic Clinic: "Pathologic Physiology of the Common Bile Duct and Its Relation to Disease of the Biliary Tract"—Dr. Waltman Walters, Associate Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester.

Noon Intermission

1:00 P. M.

Address: "Obstetric Hemorrhages and Their Treatment"—Dr. Jennings C. Litzenberg, Professor of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis.

Address: "Relation of the Endocrine Glands to Sterility" Dr. Emil Novak, Associate Professor of Obstetrics, University of Maryland School of Medicine, Baltimore.

Address: "The Radical Cure of Malignant Tumors of the Bladder"—Dr. Hugh H. Young, Professor of Urology, Johns Hopkins University School of Medicine, Baltimore.

Intermission for Review of Exhibits

Address: "Treatment of Diabetes during Surgical Emergencies"—Dr. Herman O. Mosenthal, Professor of Clinical Medicine, New York Postgraduate Medical School, New York.

Address: "Problems in the Diagnosis of Diabetes" —Dr. Robert D. Lawrence, M.A., M.D., F.R.C.P., Physician to Kings College Hospital, Diabetic Department, London, England.

Address: "Neurological Surgery"—Dr. Loyal Davis, Professor of Surgery, Northwestern University School of Medicine, Chicago.

Dinner Intermission

7:00 P. M.

Address: "Endocrine Disorders in Childhood"—Dr. Frederick W. Schlutz, Richard T. Crane, Professor of Pediatrics, University of Chicago School of Medicine, Chicago.

Address: "Peritonitis—Dr. Frederick A. Coller, Professor of Surgery, University of Michigan Medical School, Ann Arbor, Mich.

Address: "Very Recent Advances in Medicine"—Dr. Russell M. Wilder, Professor of Medicine, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester.

Address: "Practical Points in Clinical Surgery"—Dr. W. Wayne Babcock, Professor of Surgery and Clinical Surgery, Temple University School of Medicine, Philadelphia.

Address: "Intravenous Anesthesia"—Dr. John S. Lundy, Professor of Anesthesia and Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester.

TUESDAY, OCTOBER 13

8:00 A. M.

Diagnostic Clinic: "Clinical Nutritional Disease (Vitamin B Deficiency)"—Dr. Andrew Almon Fletcher, University of Toronto Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic: "Diagnosis and Treatment of Brain Tumors"—Dr. Walter E. Dandy, Adjunct Professor of Neurological Surgery, Johns Hopkins University School of Medicine, Baltimore.

Diagnostic Clinic: "The Diagnosis of Bone Lesions" —Dr. Dean D. Lewis, Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore.

Intermission for Review of Exhibits

Diagnostic Clinic: "Tumors of the Breast"—Dr. John F. Erdmann, Attending Surgeon of the New York Postgraduate Hospital and Medical School, New York, N. Y.

Diagnostic Clinic: "The Psychobiology of the Peptic Ulcer Patient"—Dr. George Draper, Associate Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, New York, N. Y.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Treatment and Guidance of Patients with Damaged Hearts"—Dr. David Riesman, Professor of Clinical Medicine and Professor of History of Medicine, University of Pennsylvania School of Medicine, Philadelphia, President, Inter-State Postgraduate Medical Association.

Address: "The Treatment of Endocervicitis"—Dr. Walter T. Dannreuther, Professor of Clinical Gynecology, New York Postgraduate Medical School, New York.

Address: "Diffuse Adenomatosis of the Colon"—Dr. Fred W. Rankin, Lexington, Ky.

Intermission for Review of Exhibits

Address: (Subject to be supplied)—Dr. Francis J. Charteris, M.D., Ch.B., Professor of Materia Medica and Therapeutics, St. Andrews University School of Medicine, St. Andrews, Scotland.

Address: "Factors Frequently Overlooked in the Management of the Patient with Heart Disease"—Dr. Charles A. Elliott, Professor of Medicine, Northwestern University School of Medicine, Chicago.

Address: "The Diagnosis of Intracranial Complications of Aural and Nasal Sinus Suppuration"—Dr. Wells P. Eagleton, Oalr., Newark. N. J.

Address: "Treatment of Acute and Chronic Mastoiditis"—Dr. Matthew S. Ersner, Professor of Otolaryngology, Temple University School of Medicine, Philadelphia.

Dinner Intermission

7:00 P. M.

Address: "The Consideration and Management of Some of the More Common Congenital Deformities of the Rectum"—Dr. Vernon C. David, Clinical Professor of Surgery, Rush Medical College, Chicago.

Address: "The Diagnosis and Treatment of Tumors of the Bladder by means of the Roentgen Rays"—Dr. George E. Pfahler, Professor of Radiology, University of Pennsylvania Graduate School of Medicine, Philadelphia.

Address: "The Cerebral Regulation of Autonomic Function"—Dr. John F. Fulton, Sterling Professor of Physiology, Yale University School of Medicine, New Haven, Conn.

Address: "Syphilis of the Heart and Blood Vessels" —Dr. Maurice C. Pincoffs, Professor of Medicine, University of Maryland School of Medicine, Baltimore.

Address: "The Management of Intestinal Obstructions"—Dr. Owen H. Wangensteen, Professor of Surgery, University of Minnesota Medical School, Minneapolis.

WEDNESDAY, OCTOBER 14

8:00 A. M.

Diagnostic Clinic: "Paralyses in Children"—Dr. Bronson Crothers, Assistant Professor of Pediatrics, Harvard University Medical School, Boston.

Diagnostic Clinic: "Carcinoma of the Stomach"—Dr. Donald C. Balfour, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester.

Diagnostic Clinic: "Economic Advantages of Early Protected Weight-Bearing in Fractures of the Leg, Foot and Ankle"—Dr. Fraser B. Gurd, McGill University Faculty of Medicine, Montreal, Canada.

Intermission for Review of Exhibits

Diagnostic Clinic: "Essential Hypertension"—Dr. Alfred W. Adson, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, and Dr. E. V. Allen, Assistant Professor of Medicine, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester.

Diagnostic Clinic: "Bodily Type in Relation to Endocrine Function"—Dr. Charles R. Stockard, Professor of Anatomy, Cornell University Medical College, New York.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "The Nature and Management of Nephritis Edema"—Dr. Louis H. Newburgh, Professor of Clinical Investigation in Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

Address: "Circulatory Failure in Acute Infectious Diseases"—Dr. William R. Williams, Professor of Clinical Medicine, Cornell University Medical College, New York.

Address: "Genesis and Surgical Treatment of Essential Hypertension"—Dr. George Crile, Cleveland Clinic, Cleveland.

Intermission for Review of Exhibits

Address: "Relation of Diseases of the Sinuses to Organic Disease"—Dr. Robert F. Ridpath, Professor of Laryngology and Rhinology, Temple University School of Medicine, Philadelphia.

Address: "Intrathoracic Goiter"—Dr. Charles G. Heyd, Professor of Clinical Surgery, New York Postgraduate Medical School, New York.

Address: "Non-Surgical Diseases of the Colon"—Dr. Joseph W. Larimore, Associate Professor of Clinical Medicine, Washington University School of Medicine, St. Louis.

Address: "The Surgical Anatomy of the Anal Canal" (including methods of Treatment of Fistula-in-Ano) —Mr. C. Naunton Morgan, F.R.C.S., Senior Assistant Surgeon to St. Mark's Hospital for Diseases of the Rectum; Surgeon to the Hospital for Tropical Diseases; Casualty Surgeon to St. Bartholomew's Hospital, London, England.

ASSEMBLY DINNER

7:00 P. M.

Informal

For members of the profession, their ladies and friends.

Dr. David Riesman, Master of Ceremonies.

Presentation of Token of Appreciation to Dr. Charles H. Mayo and Dr. William J. Mayo, Rochester.

Addresses by eminent members of the profession and other distinguished citizens of the world.

THURSDAY, OCTOBER 15

8:00 A. M.

Diagnostic Clinic: "The Relation of the Psychoses to Systemic Diseases"—Dr. Earl D. Bond, Professor of Psychiatry, University of Pennsylvania School of Medicine, Philadelphia.

Diagnostic Clinic: "Indications for Surgery and the Surgical Treatment of Peptic Ulcer"—Dr. Frank H. Lahey, Director of Surgery in the Lahey Clinic; Surgeon of the New England Baptist Hospital and New England Deaconess Hospital, Boston.

Diagnostic Clinic: "The Relation of Endocrine Glands to Circulatory Diseases"—Dr. Leonard G. Rowntree, Director, Philadelphia Institute for Medical Research, Philadelphia.

Intermission for Review of Exhibits

Diagnostic Clinic: "Cryptorchidism"—Dr. Hugh Cabot, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester.

Diagnostic Clinic: "The Relation of Lumbosacral Joint to Low Back Pain"—Dr. Alan DeForest Smith, Clinical Professor of Orthopedic Surgery, Columbia University College of Physicians and Surgeons, New York.

Noon Intermission

1:00 P. M.

Address: "Allergic Diseases"—Dr. Robert A. Cooke, Assistant Professor of Clinical Medicine, Cornell University Medical College, New York.

Address: "Significance of Menorrhagia and Metrorrhagia"—Dr. John R. Fraser, Professor of Obstetrics and Gynecology, McGill University Faculty of Medicine, Montreal, Canada.

Address: (Subject to be supplied)—Dr. Charles H. Mayo, Mayo Clinic, Rochester.

Address: "Applications of Cavity Grafting"—Mr. Archibald H. McIndoe, M.B., Ch.B. (N.Z.); M. Sc. (Path.); M.S., F.A.C.S.; F.R.C.S. (England), Assistant Plastic Surgeon, Plastic Unit. St. James' Hospital; Consulting Plastic Surgeon, Royal North Staffordshire Infirmary; Chief Assistant Plastic Surgery, St. Bartholomew's Hospital; Sen. Surgeon, Hospital for Tropical Diseases, London, England.

Intermission for Review of Exhibits

Address: "Function and Deformity in Fracture Results"— Dr. Eldridge L. Eliason, Professor of Clinical Surgery, University of Pennsylvania School of Medicine, Philadelphia.

Address: "The Early Diagnosis of Bronchiogenic Carcinoma"—Dr. Chevalier Jackson, Professor of Bronchoscopy and Esophagoscopy, Temple University School of Medicine and Dr. Chevalier L. Jackson, Professor of Clinical Bronchoscopy and Esophagoscopy, Temple University School of Medicine, Philadelphia.

Address: "Water Balance in Children"—Dr. Samuel Z. Levine, Acting Professor of Pediatrics, Cornell University Medical College, New York.

Address: "The Surgery of Acute and Chronic Compression of the Heart"— Dr. Claude S. Beck, Associate Professor of Surgery Western Reserve University School of Medicine, Cleveland.

Dinner Intermission

7:00 P. M.

Address: "Ophthalmic Consultations in a General Hospital." (The Joseph Schneider Foundation Presentation.)—Dr. Lawrence T. Post, Professor of Ophthalmology, Washington University School of Medicine, St. Louis.

Address: "General Therapeutic Methods for the Protection of Patients in the Extremes of Life"—Dr. Irving S. Cutter, Dean and Associate Professor of Medicine, Northwestern University Medical School, Chicago.

Address: "Periodic Health Examination"—Dr. Reginald Fitz, Associate Professor of Medicine, Harvard University Medical School, Boston.

Address: "The Diagnostic Significance of the Respiratory Rate"—Dr. Frederick J. Kalteyer, Clinical Professor of Medicine, Jefferson Medical College, Philadelphia.

Address: "The Sella Turcica"—Dr. Eric Oldberg, Professor of Neurology and Neurological Surgery, University of Illinois College of Medicine, Chicago.

FRIDAY, OCTOBER 16

8:00 A. M.

Diagnostic Clinic: "The Differential Diagnosis of Pain in the Chest"— Dr. John A. Oille, Assistant Professor of Medicine, University of Toronto Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic: "Fracture of the Neck of the Femur: The Problem Fracture"—Dr. John J. Moorhead, Professor of Clinical Surgery New York Postgraduate Medical School, New York.

Diagnostic Clinic: "Protamine Insulin"—Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard University Medical School, Boston, and Dr. Priscilla White, Boston.

Intermission for Review of Exhibits

Diagnostic Clinic: "Review of Operative and Nonoperative Treatment of Prostatic Obstruction"—Dr. William E. Lower, Cleveland Clinic, Cleveland.

Address: "The Differential Diagnosis of Chills and Fever"—Dr. James H. Means, Jackson Professor of Clinical Medicine, Harvard University Medical School, Boston.

Noon Intermission

1:00 P. M.

Address: "Diabetes Insipidus"—Dr. Elliott C. Cutler, Moseley Professor of Surgery, Harvard University Medical School, Boston.

Address: "Treatment of the Elderly Chronic Cardiac"—Dr. Cary Eggleston, Assistant Professor of Clinical Medicine, Cornell University Medical College, New York.

Address: (Subject to be supplied)—Dr. William J. Mayo, Mayo Clinic, Rochester.

Intermission for Review of Exhibits

Address: "The Applied Physiology of the Sphincter of Oddi"—Dr. Andrew C. Ivy, Davis Professor of Physiology and Professor of Pharmacology, Northwestern University Medical School, Chicago.

Address: "The Acute Abdomen"—Dr. Irvin Abell, Clinical Professor of Surgery, University of Louisville School of Medicine, Louisville, Ky.

Address: "The Role of the Practitioner and the Specialist in the Management of Urinary Tuberculosis"—Dr. Joseph F. McCarthy, Professor of Clinical Urology, New York Postgraduate Medical School, New York.

NEWS ITEMS

Dr. W. G. Furgeson, formerly of St. Paul, has recently opened offices for general practice at Fargo.

Dr. Arthur J. Smith has opened offices for the practice of surgery and medicine at Yankton, S. D.

Dr. John H. Rishmiller, who has been spending several months in California, has returned to Minneapolis.

The Glen Lake Sanatorium at Oak Terrace, Minn., budget for 1937 has been completed and will foot $505,562.00.

Dr. Bernard T. Lenz, a graduate of the University of Minnesota in 1935, has joined the staff of the Huron Clinic at Huron, S. D.

Dr. S. R. Lee, 37 years of age, superintendent of Ancker hospital, St. Paul, died on August 10, following an operation for appendicitis on July 30.

Dr. L. H. Huber, one of the prominent physicians of Livingston, Mont., passed away on the morning of August 4, after suffering from a long illness.

Dr. E. G. Balsam, Billings, was one of the guest speakers at the meeting of the Montana Hospital Association, held at Great Falls last month.

Dr. Lynn Hammerstad, a recent graduate of the University of Minnesota, has become an associate of Dr. A. G. Chadbourn, at Heron Lake, Minn.

The eighth annual training course for Medical Department Reservists of the Army and Navy will be held at the Mayo Foundation, Rochester, from October 4 to 17.

Dr. Richard Olding Beard, professor emeritus of physiology in the University of Minnesota, and nationally known medical authority, died at his Minneapolis home on August 14.

Dr. A. F. Risser, formerly of St. Paul, has moved to Stewartville, Minn., where he will continue general practice. Dr. Risser is a recent graduate of the University of Minnesota.

The members of the Stearns-Benton Medical Society held an all-day picnic at Big Birch Lake, Minn., last month, with plenty of games, bathing and an address by Dr. B. J. Branton of Willmar.

Plans for physical examination of children under six years at the South Dakota State Fair at Huron, September 14-18, will be made by Florence Walker Englesby of the state board of health.

The Governor of North Dakota has recently appointed his State Medical Examining Board, who are: Drs. G. M. Williamson, Grand Forks; Albert W. Skelsey, Fargo, and Archie D. McCannel, Minot.

Dr. N. T. Owen, Rapid City, has been named president of the South Dakota board of medical examiners. Dr. Carl Feige, Canova, is vice-president, and Dr. B. A. Dyar, Pierre, director of medical licenses.

The $1,200,000 Minnesota state hospital for the insane at Moose Lake has been approved by all examining divisions of the Public Works administration and is now before President Roosevelt for final endorsement.

Physicians are not required to guarantee a cure, the Minnesota Supreme Court held recently in upholding a directed verdict for Drs. J. W. and Paul Gamble of Albert Lea, in a $22,000 suit for alleged malpractice.

On July 1st, four interns, all graduates of the University of Minnesota in the class of 1935, began internships at Trinity Hospital, Minot, N. D. Their names are: Leslie Grams, Fred Ellis, Robert St. Clair and Ralph Erickson.

Work on the Sioux Indian sanitarium in Rapid City, S. D., involving about $400,000, and a new 100-bed surgical unit for the Battle Mountain Sanitarium, Hot Springs, involving expenditures of about $175,000, will be started this fall.

What is described as the "Happiest Camp" ever experienced in the history of Camp Grassick, N. D., health camp, on the shores of Lake Isabel, was brought to a close last month. Dr. E. A. Pray, Valley City, is president of the association.

Dr. James P. Learmonth, regius professor of surgery at the University of Aberdeen, Scotland, formerly of Rochester, has been appointed the king's surgeon in Scotland by Edward VIII. Dr. Learmonth held the same position under Georve V.

Dr. David D. Anderson of Minneapolis sailed August 26th to do post-graduate work in Vienna. He was accompanied by his wife and will visit in France, Belgium, Germany, Austria, Switzerland, England and France, and will return home in early November.

The supreme court of South Dakota handed down a ruling recently that mandatory testing of cattle cannot be carried on under existing laws. The decision will prevent the state department of agriculture from forcing farmers to submit their cattle to tuberculin tests.

Dr. Charles N. Spratt, Minneapolis, who contributed the article *Traumatic Detachment of the Retina* to the October 15, 1935, issue of The Journal-Lancet, has given his oil painting of the old boat landing at Excelsior, Minn., to the Minnesota Historical Society.

Dr. E. W. Goldman, who has been in active practice for the past 30 years at Madison, S. D., died on August 8, after suffering from a long illness. Dr. Goldman had taken an active part in all civic matters, and at the time of his death was the state senator from that district.

Active in civic and medical circles, Dr. Bertha Brainerd, Jamestown, N. D., physician and surgeon, is president of the Stutsman County Medical Society, and head of the American Association of University Women. She is a graduate of the University of North Dakota and Rush Medical College.

Dr. H. I. King, Aberdeen, S. D., physician, has taken his place among the 300 outstanding Catholics in the world. In elaborate ceremonies attended by 37 priests of South Dakota, Dr. King became a Knight of St. Gregory, an order created by Pope Gregory XVI in 1831 in commemoration of Gregory the Great (590-604).

Dr. Hugh Cabot, of Rochester, accompanied by Mrs. Cabot, sailed for Europe, where he will lecture at St. Thomas' hospital, London, and will attend the joint meeting of the Clinical Society of Genito-Urinary Surgeons and the British Clinical Society of Urology in London, September 3 and 4. He also will present a paper in Vienna before the International Congress of Urology, which is meeting from September 9 to 12.

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Tuesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: September 1, "Causes of Blindness"; September 8, "Plantar Warts"; September 15, "Fear in Childhood"; September 22, "Gout"; September 29, "Loss of Teeth."

A joint meeting of officers of the Minnesota State Medical Association and the Minnesota State Hospital Association was held last month at Green Lake, Willmar, Minn. The visitors were guests of Drs. B. J. and A. F. Branton. Those in attendance were: Dr. W. W. Will, Bertha; Dr. W. H. Hengstler, St. Paul; Dr. W. L. Burnap, Fergus Falls; Supt. Victor Anderson, Abbott Hospital, Minneapolis; Supt. J. H. Norby, Fairview Hospital, Minneapolis; Supt. A. M. Calvin, Midway Hospital, St. Paul; Dr. Peter Ward, Supt., Miller Hospital, St. Paul, and Dr. S. A. Slater, Worthington. Dinner was served, and the business session followed, at which matters pertinent to both associations were discussed.

The JOURNAL LANCET

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October, 1936

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New Series

Fifty-eighth Annual Meeting of the Medical Association of Montana, Billings, July 8 and 9, 1936

OFFICERS 1936-37

PRESIDENT

J. A. EVERT, M.D. .... Glendive

PRESIDENT-ELECT

W. P. SMITH, M.D. .... Columbus

VICE-PRESIDENT

H. J. McGREGOR, M.D. .... Great Falls

SECRETARY-TREASURER

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DELEGATE TO A. M. A.

J. H. IRWIN, M.D. .... Great Falls

ALTERNATE DELEGATE

E. M. GANS, M.D. .... Harlowton

COUNCILORS

	Term Expires
L. G. DUNLAP, M.D., Anaconda	1937
E. N. JONES, M.D., Wolf Point	1937
L. T. SUSSEX, M.D., Havre	1937
T. L. HAWKINS, M.D., Helena	1938
E. D. HITCHCOCK, M.D., Great Falls	1938
E. S. MURPHY, M.D., Missoula	1938
M. SMETTERS, M.D., Butte	1938
A. D. BREWER, M.D., Bozeman	1939
J. H. Garberson, M.D., Miles City	1939
E. A. Welden, M.D., Lewistown	1939

COMMITTEES

LEGISLATIVE—J. A. Donovan, M.D., 1937; F. F. Attix, M.D., 1938; W. E. Long, M.D., 1939; J. M. Flinn, M.D., 1940; E. M. Larson, M.D., 1941.

HOSPITAL—C. C. Seerley, M.D., 1937; T. R. Vye, M.D., 1938; G. M. Jennings, M.D., 1939.

PUBLIC INSTRUCTION IN HEALTH—C. McGill, M.D.; J. F. S. Marshall, M.D.; F. L. Watkins, M.D.; H. A. Bolton, M.D.; A. R. Foss, M.D.

CANCER—G. J. McHeffey, M.D.; C. H. Fredrickson, M.D.; J. H. Bridenbaugh, M.D.; J. H. Garberson, M.D.;T. L. Hawkins, M.D.

UNIVERSITY—B. L. Pampel, M.D.; C. E. K. Vidal, M.D.; L. H. Fligman, M.D.

HISTORY OF MEDICINE AND BIOGRAPHIES—E. D. Hitchcock, M.D.; T. F. Walker, M.D.; J. H. Irwin, M.D.

ORTHOPEDIC—E. M. Porter, M.D.; E. S. Porter, M.D.; L. W. Allard, M.D.; J. C. Shields, M.D.; L. H. Fligman, M.D.

DENTISTS, PHARMACISTS, NURSES—H. W. Gregg, M.D.; W. J. Marshall, M.D.; S. E. Leard, M.D.

MEDICAL INSURANCE AND LEGAL AFFAIRS—J. C. MacGregor, M.D.; J. H. Garberson, M.D.; J. H. Bridenbaugh, M.D.; P. E. Kane, M.D.; T. L. Hawkins, M.D.; G. M. Jennings, M.D.; C. S. Houtz, M.D.; F. B. Ross, M.D.

COMPENSATION—H. Smith, M.D.; F. L. Unmack, M.D.; E. M. Farr, M.D.

INFANT WELFARE—M. D. Winter, M.D.; L. W. Baskett, M.D.; A. E. Stripp, M.D.; R. C. Davis, M.D.; G. A. Carmichael, M.D.

MEDICAL PUBLICATIONS—L. G. Dunlap, M.D.; E. D. Hitchcock, M.D.; A. Karsted, M.D.

PERIODIC HEALTH EXAMINATIONS—L. H. Fligman, M.D.; H. H. James, M.D.; L. R. Packard, M.D.

U. S. MEDICAL RESERVE—W. R. Morrison, M.D.; C. F. Jump, M.D.; E. S. Murphy, M.D.

MEDICAL ECONOMICS—J. C. Shields, M.D.; J. P. Ritchey, M.D.; R. B. Durnin, M.D.; F. F. Attix, M.D.; P. Potter, M.D.

VETERANS AFFAIRS—P. L. Greene, M.D.; R. E. Seitz, M.D.; J. H. Graham, M.D.

POST-GRADUATE WORK—Secretaries of constituent societies.

PROGRAM—E. M. Larson, M.D.; J. C. MacGregor, M.D., Secretary.

58TH ANNUAL MEETING
of the
HOUSE OF DELEGATES
of the
MEDICAL ASSOCIATION OF MONTANA
in the
NORTHERN HOTEL TEAROOM, BILLINGS

July 7, 1936, 2 P. M.

President L. H. Fligman, Helena, called the meeting to order. The delegates were requested to present credentials and the following were present: Cascade—Drs. F. L. Andrews, E. D. Hitchcock, J. C. MacGregor, E. M. Porter; Eastern Montana—Drs. W. H. Blakemore, M. G. Danskin; Fergus—Dr. C. C. Wallin; Flathead—absent; Gallatin—Dr. A. D. Brewer; Hill—Dr. W. A. Lacey; Lewis & Clark—Dr. J. M. Flinn; Mt. Powell—Dr. A. C. Knight; Musselshell—Dr. G. A. Lewis; Northeastern Montana—absent; Park—Dr. S. E. Leard; Silver Bow—Drs. P. Kane, G. J. McHeffey, J. R. E. Sievers; Yellowstone—absent. Others were: President-elect, Dr. J. A. Evert; Vice-president, Dr. H. J. McGregor; Past President, Dr. Sievers. Delegate to A. M. A., Dr. J. H. Irwin; Councilors, Drs. L. G. Dunlap, M. Smetters, E. D. Hitchcock. Members, Drs. E. R. Grigg, P. Potter, J. C. Shields and D. K. Worden. There being no contests business was in order.

Dr. J. H. Irwin, Delegate to the Kansas City meeting of the A. M. A., presented his report and asked that it be referred to a committee.

The President appointed the following committees:

Auditing—Councilors Drs. Brewer, Hitchcock and Smetters.

Nominations for the State Board of Health—Drs. Sievers, Danskin and Lacey.

Place of Meeting in 1937—Drs. Leard, Flinn, H. J. McGregor.

Medical Protective Insurance—Drs. J. C. MacGregor, Flinn, Knight, Kane, Wallin.

Blood Typing Law—Hitchcock, Porter, McHeffey.

Journal-Lancet Contract—Drs. Dunlap, Hitchcock, Karsted.

Honorary Membership Regulations—Drs. Sievers, Danskin, Leard.

Time of Annual Meeting—Drs. Andrews, Brewer, Blakemore.

Gallatin Society Business—Drs. Flinn, Brewer, Porter.

Delegates Report—Drs. Danskin, McHeffey, Lewis.

The report of the Cancer Committee was presented by Dr. G. J. McHeffey, who moved its adoption. Seconded, Dr. G. A. Lewis. Carried.

The report of the History Committee was given by Dr. E. D. Hitchcock, who moved its adoption. Seconded, Dr. S. E. Leard. Carried.

Dr. J. C. MacGregor on behalf of the Cascade Society asked for the 1937 meeting. Dr. J. H. Irwin said there was a possibility of Great Falls entertaining the next meeting of the Pacific Northwest Society and asked that the members think of the desirability of this Association meeting jointly with the Pacific Northwest and be prepared to vote upon that issue at the next session of this body.

Dr. J. M. Flinn moved the meeting adjourn until Wednesday noon. Seconded, Dr. S. E. Leard. Carried.

E. G. Balsam, M.D.,
Secretary.

HOUSE OF DELEGATES

Wednesday Noon, July 8, 1936

Tearoom

The meeting was called to order by President L. H. Fligman, Helena. The following delegates were present: Cascade, Drs. F. L. Andrews, E. D. Hitchcock, J. C. MacGregor, E. M. Porter; Eastern Montana, Drs. W. H. Blakemore, M. G. Danskin; Fergus, Dr. C. C. Wallin; Flathead, Dr. W. W. Taylor; Gallatin, Dr. A. D. Brewer; Hill, Dr. W. A. Lacey; Lewis & Clark, Dr. J. M. Flinn; Mt. Powell, Dr. A. C. Knight; Park, Dr. S. E. Leard; Silver Bow, Drs. P. Kane, G. J. McHeffey, J. R. E. Sievers; Western Montana, Drs. A. R. Foss, J. P. Ritchey; Yellowstone, Drs. L. Stevens, T. R. Vye. Councilors, Drs. Brewer, Dunlap, Hitchcock, Garberson, McGregor, vice president.

There being no contests business was in order.

Dr. E. D. Hitchcock for the Auditing Committee reported that the accounts of the Secretary-Treasurer balanced, the securities were found in the bank box, the market value of the bonds showed an appreciation of $850.00, and moved the adoption of the report. Seconded, Dr. Brewer. Carried.

Dr. W. A. Lacey for the Committee on Nominations for the State Board of Health presented the following names: Drs. L. H. Fligman, A. W. Morse, J. C. MacGregor, J. H. Garberson, C. C. Wallin; and moved the adoption of the report. Seconded, Dr. Hitchcock. Carried.

Dr. S. E. Leard for the Place of Meeting Committee reported the selection of Great Falls and moved the adoption of the report. Seconded, Dr. Blakemore. Carried.

Dr. E. D. Hitchcock for the Blood Typing Law Committee reported that this question be referred to the Legislative Committee for action and suggested consultation with the officers of the Montana Legal Society before action was taken in the State Legislature, and moved the adoption of the report. Seconded, Dr. Foss. Carried.

Dr. L. G. Dunlap for the Medical Publications Committee which considered the proposal of The Journal-Lancet that this Association agree to keep that J-L as the official publication for three years and that one dollar per member be paid for 1937, one dollar and a half for 1938 and two dollars for 1939, reported in favor of accepting the offer, and moved the adoption of the report. Seconded, Dr. Andrews. Carried.

Dr. J. R. E. Sievers for the Honorary Membership Committee suggested that the By-laws Chapter 1 have a Section 4. Any doctor of medicine who has practiced for 40 consecutive years in Montana and continuously been a member in good standing in the Medical Association of Montana shall be automatically considered an Honorary Member and be relieved of payment of dues in the County and State Societies. Dr. Leard moved the adoption of this change in the By-Laws, seconded, Dr. Wallin. Unanimously carried.

Dr. F. L. Andrews for the Committee Considering Time of Annual Meeting asked to report in the General Assembly and permit all members to vote upon that question. The President granted the request.

Dr. J. M. Flinn for the Gallatin Society Business which pertains to the qualifications of cultists and violations of the medical practice act moved that a committee of three be appointed to present the facts to the Attorney-General and urge him to take the proper action. Seconded, Dr. Blakemore. Carried.

President appointed Drs. J. M. Flinn, O. Klein and T. L. Hawkins.

Dr. M. G. Danskin for the Committee on the Report of the Delegate to A. M. A. moved the adoption of the report and commended Dr. Irwin for his faithful performance of his duties and for the excellent résumé presented. Seconded, Dr. Flinn. Carried.

Dr. F. L. Andrews moved the election be held in the general assembly. Seconded, Dr. Flinn. Carried.

Dr. J. C. MacGregor for the Committee on Medical Insurance and Legal Affairs reviewed the year's work and offered the following resolution and moved its adoption. Seconded, Dr. Andrews. Carried.

Dr. S. E. Leard moved the meeting adjourn. Seconded, Dr. Flinn. Carried.

E. G. Balsam, M.D.,
Secretary.

Committee on Medical Insurance and Legal Affairs

The work of the Committee during the past year has consisted of the compiling of data on the subject of medical defense. It has been found that this subject was one of vital importance to the Association.

It is common knowledge to all of you by now that the rate on your medical defense insurance has been greatly increased over the last year, but some of you may not be informed as to the conditions which precipitated this increase.

The investigations of your committee revealed many facts of vital importance to the Association on this subject, the most important of which are as follows:

There were operating in the state of Montana two years ago some ten insurance companies who were writing medical defense. Today, there are but two, the U. S. F. & G. and the Aetna. The reason for the withdrawal of the other companies is that it was impossible for them to carry this business with a profit and of course no company can or will operate long without a profit.

It is a known fact that the two remaining companies operated with a loss last year, thus the increase of about 94 per cent for this year, endeavoring to avoid this deficit in the future; and if this rate is still inadequate I am informed that they also will withdraw.

The number of malpractice suits, as well as personal injury suits, has been steadily increasing during the past year until in some sections of the state it has assumed the proportions of a racket and unless something is done to curb it we will find our membership obliged to carry their own insurance in the not too distant future. Also, if the cases keep increasing at the present rate, and applying the law of averages, it will be only a matter of time until it will be you and I who will be made the defendant in a malpractice suit.

At the present time there are a startling number of malpractice suits filed or pending.

What are we going to do about it? This is a question your Committee has been struggling with for the past two days and endeavoring to solve.

We have found that of all the states, Montana stands first in the number of suits per number of doctors. Nevada stands second, but is still far below Montana, and so on down the ladder. We find states where malpractice suits are now unheard of. At the very bottom of the ladder we find Connecticut which only a few years ago had plenty of trouble with malpractice suits.

The Connecticut solution is the one we have studied the most and the one from which we have endeavored to pattern our solution.

They found that about 64 per cent of all malpractice suits were instituted as a result of an inadvertent remark by a physician of another's results, often not malicious or intentional but careless and thoughtless and often the result of personal animosity.

They also found that no judgment could ever be obtained in a malpractice suit unless damaging evidence were given by one doctor against a fellow practitioner so they set out to correct these loopholes by an educational program brought to each member of the association by a special committee appointed for that purpose.

Of course this necessitates the expenditure of a small amount principally for transportation of the Committee, but it need not be a very large amount.

So, with the same result hoped for, your committee offers the following resolution.

Resolution of the Committee on Insurance

Whereas, the number of malpractice suits has increased over the past few years necessitating an increase of ninety per cent in the premium rate for our protection, certified by actual figures; and

Whereas, license insurance companies have voiced disapproval of their business in this state by withdrawing from business in Montana, leaving only two companies who solicit this business; and

Whereas, with present conditions continuing, these companies may also withdraw leaving the association without protection against malpractice; and

Whereas, analysis has shown that a large percentage of these cases has been instituted by inadvertent comment or criticism of one physician's work by another; and

Whereas, medical testimony, especially expert, is required in all cases; and

Whereas, payment for such medical testimony, especially expert, adds several fold to the expense of each case, whether said expense falls on the individual or the defendant's insurance company, thereby tending to increase insurance rates; and

Whereas, the witness who testifies without pay or expectation thereof carries materially more weight with judge and jury than does a paid witness; and

Whereas, the purpose of this association (to promote friendly intercourse between physicians; to guard and foster the material interests of its members and to protect them against imposition) requires of each member the rendering of all possible help to his fellow members; and

Whereas, your committee feels that a certain amount of time should be expended on the investigations of every case brought against any member of this association; therefore be it

Resolved, that the house of delegates of the Medical Association of Montana during the fifty-eighth annual meeting in Billings, Montana, July 8th and 9th, 1936, states and affirms as a policy, that each member of said association shall give medical testimony, including expert testimony, in a malpractice case of any defendant fellow member, without fee, reward, or expectation thereof; such action being solely for the better protection of and the mutual helpfulness within the profession; and

Therefore, be it resolved that the following suggested plan be adopted by the Medical Association of Montana, for the solution of these difficulties. That a committee be created in the State Medical Association composed of eight members located at different parts of the state to be known as the Committee of Medico Legal Ethics. This Committee to be governed by the following by-laws.

Committee on Medico Legal Ethics

SECTION 1: There shall be a Committee of the Association to be known as "The Committee on Medico Legal Ethics." It shall consist of eight appointed members and the President of the Association as an ex-officio member with voting power. The President shall appoint this Committee. When first made up, two members shall be appointed to serve for the term ending at the annual meeting in 1937, two until the annual meeting in 1938, two until the annual meeting in 1939, and two until the annual meeting in 1940. Thereafter, two members shall be appointed each year by the incoming President at the annual meeting to serve for four years. Any vacancy occurring in the Committee shall be filled by the President at once.

SECTION 2: It shall be the duty of this Committee whenever any claim of malpractice against a member of the profession is made or threatened to be made, to investigate the case and to advise concerning its handling in co-operation with all those concerned.

SECTION 3: It shall be the policy of this Committee and of the Association to respect the privilege of every member to testify in any case as his conscience and opinion may dictate, and the Committee shall not seek to prevent any member from so doing. It shall in all matters act with due regard to the rights of the patient.

SECTION 4: Whenever the Committee is informed that a claim of malpractice is made or threatened, the chairman shall, if deemed advisable, summon a meeting of the Committee or local member thereof, for the purpose of investigating the circumstances connected with the case.

SECTION 5: It shall be the duty of every member of this Association to notify the chairman of this Committee of any malpractice claim made or threatened against him or against any other member of the profession and to appear before this Committee at any time when he may be called and give the Committee all the information he may possess regarding the case.

SECTION 6: It shall be the duty of every member of this Association who contemplates assisting in the preparation of a malpractice suit, or testifying in any such suit, first to notify the Committee of his intention and to give to the Committee his reasons therefor.

SECTION 7: No member of this Association shall make a charge for services or accept any compensation for acting with regard to a malpractice claim or suit unless the Committee shall consent.

SECTION 8: It is the policy of this Association that no member shall speak disparagingly of the treatment given by any other member until he has thoroughly investigated the circumstances as they existed at the time of the treatment.

SECTION 9: A violation of any of the above rules by a member of the Association shall be deemed just cause for his discipline by the Association.

SECTION 10: It shall be the duty of this Committee to prefer charges in the manner prescribed by the governing Article of the Constitution of the State Medical Association against any member of the Association who has voiced criticism without justification or without seeking full information as to all the facts or without consulting the Committee.

SECTION 11: That the actual expenses incurred by one or all members of this Medico Legal Ethics Committee, while investigating or testifying in any case, be paid from a special fund allotted from the State Medical Association.

A. C. Knight, M.D.
P. E. Kane, M.D.
C. C. Wallin, M.D.
J. M. Flinn, M.D.
J. C. MacGregor, M.D.
Chairman.

58TH ANNUAL MEETING

of the

MEDICAL ASSOCIATION OF MONTANA

in the

NORTHERN HOTEL TEAROOM, BILLINGS

July 8, 1936

The meeting was called to order by the President, L. H. Fligman, M.D., of Helena.

Dr. J. I. Wernham of Billings, President of the Yellowstone Valley Society, welcomed the members of the Medical Association of Montana to Billings and announced the various entertainments.

Dr. H. J. McGregor, Great Falls, responded for the Association.

Dr. E. G. Balsam, Billings, presented the report of the Secretary-Treasurer.

Dr. L. H. Fligman, Helena, delivered the Address of the President.

Dr. R. C. Webb, Minneapolis, presented Fractures and illustrated with pictures.

Dr. W. A. O'Brien, Minneapolis, told of the Treatment of Anemia.

Dr. A. J. Lanza, New York City, explained the Newer Methods of Diagnosis and Treatment of Pneumonia.

Dr. E. D. Hitchcock, Great Falls, gave the Highlights in Routine Gastric Examinations.

Dr. Henry Schmitz, Chicago, told about the Periods of Sterility in Women.

Dr. L. M. Randall, Rochester, explained the Indications for Caesarian Section.

Dr. E. S. Murphy, Missoula, told about Montana's Pioneer Physician.

July 9, 1936

Dr. Roderic O'Connor, San Francisco, explained his Eye Muscle Work.

Dr. A. J. Movius, Billings, presented Subphrenic Abscess.

Dr. A. R. Foss, Missoula, explained the Manifestations of Allergy in General Practice.

Dr. W. A. O'Brien, Minneapolis, gave the Indications for Radiation Therapy.

Dr. Henry Schmitz, Chicago, reported on the Treatment of Pelvic Carcinomas with 800 K. V. After Thirty Months.

After a recess of five minutes the business session was ordered.

President Fligman announced that the delegates had selected Great Falls as the place for the 1937 meeting. There was some discussion about a joint session with the Pacific Northwest Society.

Dr. F. L. Andrews for the Committee Considering Time of Annual Meeting reported that there be no change in the time and moved the adoption of the report. Seconded, Dr. H. J. McGregor. Carried.

Dr. J. R. E. Sievers read the change in the By-Laws pertaining to Honorary membership as adopted in the House of Delegates. Dr. Leard moved it be adopted. Seconded, Dr. Blakemore. Carried unanimously.

Election.

President-Elect—Dr. W. P. Smith, Columbus, was nominated by Dr. E. M. Porter, who moved the nominations be closed and that the Secretary cast the unanimous Ballot of the Association for Dr. Smith. Seconded, Dr. H. W. Gregg. Carried.

Vice-President—Dr. H. J. McGregor, Great Falls, was nominated by Dr. E. M. Gans, who moved the nominations be closed and the Secretary cast the unanimous Ballot of the Association for Dr. McGregor. Seconded, Dr. E. D. Hitchcock. Carried.

Secretary-Treasurer—Dr. E. G. Balsam, Billings, was nominated by Dr. A. Karsted, who moved the nominations be closed and that the President cast the unanimous Ballot of the Association for Dr. Balsam. Seconded, Dr. E. M. Adams. Carried.

Councilors—Drs. A. D. Brewer, J. H. Garberson and E. A. Welden were nominated to succeed themselves by Dr. W. T. Williams, who moved the nominations be closed and the Secretary cast the unanimous ballot for those three Councilors. Seconded by Dr. F. L. Andrews. Carried.

Past Presidents Drs. Garberson and Sievers conducted Dr. J. A. Evert to the chair where retiring President Dr. Fligman gave him the gavel. Dr. Evert told the members of his appreciation of their confidence in him and promised to do the best he could for them and the Association.

Dr. L. H. Fligman on behalf of the Association thanked the guest speakers, Drs. Lanza, O'Brien, O'Connor, Randall, Schmitz and Webb, for making their part of the program so important and extended to them a cordial invitation to return at their pleasure assuring them of a hearty welcome. He also said the courtesy of the Yellowstone Valley Society and the people of Billings was appreciated by the visitors and he expressed thanks for all. Adjourned.

E. G. Balsam, M.D.,
Secretary.

COUNCIL MEETING

Tuesday, July 7, 1936

4 P. M.

The meeting was called to order by President L. H. Fligman, M.D. Councilors present were: Drs. A. D. Brewer, L. G. Dunlap, E. D. Hitchcock, M. Smetters, L. T. Sussex.

Dr. Hitchcock presented some of the work of the History Committee and stated that it would be necessary to have money to continue. Dr. Dunlap moved that $1,000.00 be given the History Committee. Seconded, Dr. Brewer. Carried.

Dr. Sussex moved the meeting adjourn. Seconded, Dr. Smetters. Carried.

E. G. Balsam, M.D.,
Secretary.

REPORT OF DR. J. H. IRWIN DELEGATE TO A. M. A. CONVENTION

Kansas City, Mo., May 11-15, 1936

For a delegate to a convention to make an interesting and constructive report of the proceedings to the home organizations is frequently a task calling for diplomacy and tact combined with judgment and finesse more than most of us possess. I have considered at length along just what lines my report should follow. The complete minutes are printed in the A. M. A. Journal and those sufficiently interested may read and obtain a more complete knowledge of the details of the transactions of the House of Delegates than I myself have. There are, however, certain aspects of the meeting that are not brought out in the printed report. On some of these I wish first to dwell.

I arrived in Kansas City Sunday about noon and thought I would be one of the early ones. Much to my surprise, I found the lobby of the Hotel Muhlebach already crowded with delegates and officials of the A. M. A. I spent most of the afternoon meeting old friends, discussing the situation presented by our dear friend's illness, President-elect Tate Mason, dear to the hearts of all Montana doctors, listening to talks on social medicine, group practice, possible candidates for presidential election, the California situation, the next place of meeting and various other questions arising.

There was one question constantly thrusting itself to the fore which seemingly would not down. At some time it presented itself in every group and to which there seemed no satisfactory answer except in a very general sort of way. That question is—What are we, the Medical Profession, going to do about all this unrest—social medicine, state medicine, free clinics and all the other questions constantly arising? Are we to sit calmly to one side and allow the politicians, the so-called philanthropists, the busybodies, to settle them for us or are we who are vitally concerned going to take an active part in the final say and make known to the public and the other interested persons our position and insist that we, as perhaps the most interested group, have something to say about the ultimate disposition of these questions?

Of course there can be but one answer when discussing questions of importance to the Medical Profession. But, if we are going to have a say, are going to do something ourselves, are not going to be dictated to, and dominated by, and be subservient to these same politicians, philanthropists and what not, we must do more than sit idly by and watch the procession from the sideline. What, then, is the answer?

In the words of Benjamin Franklin: "We must all hang together or we will hang separately." We must make our county society stronger, our state association more powerful, and representatives of our national organization truly representatives of the entire medical profession. Every man practicing regular medicine and licensed by his state to practice the same should belong to the county medical society and to the state and national associations, should give his support and counsel to, and aid and support in every way the organized medical profession. Unless we do exactly that, we are apt some of these fine mornings to awaken to the fact that we *are* dominated, controlled and are subservient to these people mentioned above. The results will be the lowering of the standards of medical care, i. e., less and poorer care to the patient, a slowing up of medical progress, poorer medical schools and demoralization of the profession as a whole, more work, less pay, less freedom of thought and what is the ultimate consideration—vastly poorer service to the patient.

Let me then, as one of the messages brought to you by your delegate, urge upon each of you more active concern in the affairs of your county, state and national associations.

It has often been said by those inimical to the A. M. A. that it did not truly represent the American Medical Profession, that it was made up of a group of self-selected and appointed men who had only their own welfare at heart and no concern for the average practitioner. If such charges should be wholly or partly true, we have only ourselves to blame. We elect delegates to the A. M. A. and the delegates are absolutely the governing body. Whatever the delegates decide by vote is the final word. Therefore, it is only necessary for the constituent societies to elect and instruct delegates who will carry out their wishes. This, by the way, is an argument for holding the state meeting before instead of after the A. M. A.

Dr. Harold M. Camp, Secretary of the Illinois State Medical Society, in his closing remarks at the Northwest Regional Conference in Chicago in February, 1936, states: "I think one of the most unfortunate things in connection with the work of the American Medical Association is the fact that so many of our members are not aware of what the American Medical Association is doing and can do for its membership. Information concerning the various bureaus, medical economics, investigation, medico-legal problems, public health, medical education, the package library and many other facilities are available to the membership and this is not known to many of our members."

Dr. Camp also has a very good suggestion regarding co-operation in the State Health Departments, "The state medical society and its entire membership should co-operate thoroughly with the state department of health. We are most fortunate in this section of the country to have in our states, directors or commissioners of health who are active members of our state medical societies and who invariably seek the advice of the society before undertaking new activities. Now that the federal Social Security Act is a law and no longer a controversial subject, we should endeavor to aid our health directors in developing plans for using the allocated funds so that they will not interfere with the ethical medical practice but perhaps aid the profession in our work."

All of the above is presented with the idea of trying to impress upon you the importance at this particular time of unrest and clamor for something new and something for nothing (as state medicine) of presenting a solid front and this can only be done by active support of our county, state and national medical organizations.

The House of Delegates met at 10 A. M., Monday, and, after the usual preliminaries, listened to addresses by Speaker Van Etten, President McLester, President-elect J. Tate Mason, and Vice-president Lynch. These admirable talks I recommend to you for careful consideration. They are printed in the May 23rd issue of the Journal. I wish to call to your particular attention certain paragraphs in Speaker Van Etten's talk. He said: "Every physician should employ all his abilities in the promotion of the public health. Every physician is politically potential. Every physician will find responsive hearing in every home which he visits if he will take the trouble to educate himself sufficiently to be able to discuss intelligently matters of local or national policy which concern the health of the community. He must acquire much more than a superficial knowledge of political machinery and must take his place therein. Dignified aloofness is stupidity dictated by laziness. The medical citizen of this type deserves nothing from our people and his profession will sink into economic slavery if he is allowed to direct it."

In President McLester's talk, I wish particularly to cite the following: "Can we afford to rest here? Any one who reads history will say no. In Germany during the last half of the previous century there came first many social reforms, agrarian, industrial, maternal welfare, old age pensions and unemployment insurance, and then finally in the effort to quiet the continued unrest of the people, and as a panacea for many social ills, Bismarck brought about many drastic changes in medical practice. This led to the present deplorable krankenkassen system. A somewhat similar train of events, the result perhaps of different motives, followed in the Scandinavian countries and in France. Then, finally, in England in the wake of other reforms, came Lloyd George's introduction of the panel system. Always, wherever government has reached out for control of the practice of medicine, it has been at the end of a long series of other so-called social reforms, and such control once established has never been relaxed.

Will history repeat itself in the United States of America? The train of events that I have attempted to describe as having taken place in European countries is already well started in this country, as can be seen in the maternal welfare, old age pension and other provisions of the Social Security Act recently enacted by Congress. Will the politicians of the near future, anxious to carry governmental subsidies still further extend their control, as politicians have already done elsewhere, to medical care? Certainly, if I read history aright, the attempt will be made and repeatedly. Whether it will succeed depends in large measure on the attitude of the medical men of America. There is only one voice that speaks authoritatively for the physicians of America, and that is the American Medical Association."

I also wish to quote his final remarks regarding President-elect J. Tate Mason: "And now may I speak of what is uppermost in the minds of all of us, of the great distress we feel, you and I, over the illness of our friend and president-elect. During our brief period of service together as officers in the association I have come to feel a deep affection for him and to entertain a high regard for his professional ability. Together, he and I made a visit last winter to certain Eastern cities, where we discussed the work of the Association and endeavored to interpret your policies. Our object was to tell the members of the profession of the far reaching influence for good of this great association and to convince them of the wisdom of the policies adopted by you. If there had been the least doubt in my own mind, Tate Mason would have convinced me. Those of you who heard him, I am sure, were proud that he represented you. Tate Mason is built of fine stuff. His qualities of heart and mind endear him to all men who know him. His illness is a great sorrow to all of us and I know that you join me in wishing him an early recovery."

President-elect J. Tate Mason's address was read by Dr. Brien King of Seattle, Washington. This address was particularly instructive and I hope all of you will take the trouble to read it entirely. I will here quote only his conclusion: "In conclusion, a majority of the men whom I have met in this country feel that they had no great disapproval of the adoption of sickness insurance carried out by the local medical societies if it had the approval of the majority of the members. However, on the other hand, they were almost unanimous in their disapproval of the adoption of the sickness insurance, either of the voluntary or the compulsory variety, as a whole. They likewise disapproved of the extension of federal control of medicine.

To those of you interested in physical therapy, I suggest reading the report on page 1,819 of the Journal of the A. M. A. for May 23rd, of the Council on Medical Education and Hospitals. This report gives a comprehensive outline of recommended requirements for technicians. Following this there is also outlined essential requirements for clinical Laboratory Technicians.

In the supplementary report of the Judicial Council I wish to quote the following paragraph: "There are at present several members of this Association who are either serving sentences for felonies or have recently terminated such sentences. Their names are carried as members in the American Medical Directory. This condition is brought about by County Societies and State Associations neglecting or refusing to expel such felons. The Judicial Council believes that the continuance of such men in membership, and the publication of their names as members in the American Medical Directory, are beneath the dignity of this Association and open the door to harmful criticism of the organized profession. The Council at the proper time will offer an amendment to the Constitution to relieve the present situation."

In the same report the Judicial Council reports on the interpretation of the Constitution and By-Laws governing the installation of the President-elect. The report as previously intimated was not accepted. The House of Delegates voted unanimously to have Dr. Mason installed in "absentia." I assure you gentlemen that emotional feelings ran high during the discussion and all seemed happy over the final decision.

At about this time we were honored by a visit by Lord Horder of England, personal physician to the king. His address is printed in whole in the May 30th issue of the Journal of the A. M. A.

The report of the committee on legislation and public relations (on which committee your delegate had the honor to be appointed) is printed in full, but I especially wish to call your attention to the following paragraphs: "Your committee calls attention to the fact that there seems to be a distinct advantage in the enactment of uniform state narcotic drug acts, as facilitating the enforcement of necessary regulations. Your committee further recommends the inclusion of regulations in control of the production, preparation and distribution of cannabis, and the prohibition of the sale of barbituric acid, compounds and derivatives, dinitrophenol and other substances peculiarly potent for harm when self-administered. It is recommended that they be sold only on the prescription of licensed physicians, dentists or veterinarians."

The third paragraph, relating to the report by physicians of gunshot and other wounds: "Your committee recommends that, where legislation is enacted by which gunshot and other wounds are made reportable by physicians, the medical profession should insist that the same requirements be imposed on every other person having knowledge of the wound and the possible conditions under which it was inflicted."

"Your committee further recommends that the American Medical Association go on record as condemning the practice of performing operations designed to alter the appearance so as to conceal the identity of the individual."

"Page 79 of the Handbook 'Co-operation with State and County Associations': The report of the Bureau of Legal Medicine and Legislation herein raises a very important question as to the advisability of carrying on all consultation and correspondence directed to the Bureau of Legal Medicine and Legislation through the offices of the constituent state associations. The question of the facility of this plan would depend very much on the willingness and capacity of the organization of the constituent state associations to care for the additional matter which would pass through their respective offices. Your committee recommends that this subject be brought up for discussion at the next meeting of the Conference of Secretaries of Constituent State Medical Associations in order that it may be given a more thorough discussion."

I wish to call your attention to the report of the committee to study contraceptive practice. This committee has made a careful review of the subject and their complete report should be read by all.

I wish to call attention to the proposed amendments to the Constitution and By-Laws—see page 1,913 in the May 30th issue of the Journal, and suggest that a committee be appointed to report on same at the next meeting.

Dr. E. H. Cary, Chairman of the Committee on Legislative action, made a very interesting and instructive and exhaustive report on their activities and I think a review of his report also deserves the consideration by a special committee to report back to this body.

At this stage of the proceedings a very interesting talk by Will Shafroth of the American Bar Association was given. An interesting feature of his talk was the statement by him that the American Bar Association was considering organizing along the lines of the A. M. A., with a House of Delegates, etc.

Attention is called to the Secretary to the report by the Chairman of the Executive Committee, C. E. Morgan, on page 1,916 of the A. M. A.—May 30th.

The report of the Board of Trustees is a very comprehensive one, giving as it does, details of the business affairs of the A. M. A., the publishing of the Journal, all the special journals including Hygeia, the Cumulative Index Medicus, what these journals are costing us, and the financial condition of the Association. An interesting part of the report is about the new building operations very materially increasing the facilities of headquarters.

The final report of the Committee on Legislative Activities contains much information of value to our State and County Societies and should be thoroughly considered by the secretaries of the same.

Attention is called to the change in By-Laws proposed: "Membership in this Association shall continue only so long as the individual is a member of a component society of the constituent association through which he holds membership and who is not now serving or within twelve months has not served, a sentence for felony."

The election of officers was a rather hotly contested affair, and resulted in the choice of Dr. J. H. J. Upham of Columbus, Ohio, for President, Dr. Chas G. Heyd of New York, as Vice-president—who now assumes the duties of President.

The choice of the next meeting place was extremely close—Atlantic City winning over Philadelphia by one vote.

I will leave to the other members who attended the Kansas City session to report on the Scientific sessions, the commercial exhibits, and the truly marvelous scientific exhibits. These scientific exhibits alone are worth the time and money to see.

Respectfuly,

J. H. Irwin, M.D.
Delegate.

PRESIDENT'S ADDRESS

Louis H. Fligman, M.D.

Helena, Montana

Members of the Montana State Medical Association, Ladies and Gentlemen:

For many years, it has been the custom for the President of the Association to deliver an address at its annual meeting, and many of these addresses merited this name, but, on this occasion, I do not feel that what I have to say to you warrants the dignity of the title of "Address." This is just to be a little talk to you members on my reaction to some of the various phases of the work of this organization in the past year.

You will all remember, I am sure, that at the beginning of this year, the most vital matter on hand at that time was Medical Relief, and I assure you that this subject was some vital at the time. Not only as it applied to each physician, but also because of the fact that some men in the organization were not satisfied with the Medical Economics Committee, which was acting as our representatives in the adjustments between the Montana State Relief group and our own Medical group. This was a trying situation, indeed, and much time was spent to iron out some of the difficulties. It is not for me to place any blame for this situation, but, of one fact I am certain, and that is that this committee worked hard and faithfully. These men did all that was humanly possible to see that every one was treated justly. The investigation, which was later instituted by the state, demonstrated wherein some of the trouble existed, which made matters so very difficult at the time. Fortunately, the whole relief problem, from the Medical Association standpoint, was all ended. This saved us probably much of discord in our midst. And, before I leave this subject, I want to thank every member of this Economic Committee for his unselfish and untiring efforts throughout the whole period of their activity. (It is with a great deal of pleasure that I leave this sore spot which festered and pained for so many months.)

At this point, I might state that, in a recent jaunt over the state, I was most pleased, indeed, to learn from various members along the way that conditions, generally, were much improved and that the economic problems that were of so much concern a few years ago had been gradually righted, this because the financial circumstances of the people of the state, generally, had been considerably improved.

Nowhere that I visited did I hear much about State Medicine or Insurance Medical Service, which to me was quite a healthy sign. Of course, we naturally must bear this phase of our work in mind, but I do not feel that we need to give it the consideration that we have in the past. The Medical Profession of Montana still believes in the American conception of human rights and liberties, which have been the foundation and inspiration of our progress. And all we desire is to be let alone to carry on according to its honorable principles and traditions without interference from Bureaucratic infringements.

The profession of Montana desires to maintain its high standards and strive, as it always has done, for the best type of individualistic service. Medicine is the most difficult of sciences and the most laborious of Arts, but, in less than a century, the medical profession has done more for the human race than has ever been accomplished by any other body of men. And all this has been accomplished by individual work, and, as individuals, we want to continue to carry on our service. And to accomplish this we naturally want to plan ahead as to how we can best perpetuate that type of service. Personally, I believe that we should try to spur on the work of our County Societies, or possibly a group of these County Societies, and one of the ways to stimulate interest might be Post-Graduate programs throughout the winter months. These either in the form of Clinics or Didactic Lecture, lasting one or two days at a time. And, then at the State meetings, try to develop the talent of our own men and give more of these places on the program to our own talent. We certainly appreciate, keenly, the sacrifice of time and effort of our guests from out of the state and we feel very grateful to them for all that they are doing for us, but, if we are to develop within ourselves, we must have more and more of our own state organization present their work at these annual meetings.

We have many young men growing up in our midst who are eager to take up the burden. These young men, full of vigor and ambition to move forward, should be given an opportunity to develop some of their own ideas and to demonstrate some of their work.

I feel that, if we can, at this meeting, formulate a real definite program of some kind bearing on just this phase of our work we will have accomplished much, indeed.

But, whatever we do, let us, as we have always done, strive through concentrated efforts to improve every avenue of *scientific progress* and develop *our art* of practice to the highest state, which, after all, is the true function of the physician.

Our legislative program is something which we have to give serious thought and, if any of the men have any constructive ideas bearing on this subject, they should, by all means, present them, either in open meetings or through delegates at their designated meeting. Of course, this phase of the work is always more or less dependent on what the legislative body has to present through the *various lobby* forces. But, if we could anticipate any move on their part, or possibly introduce any measure which we need to protect our own interests, then, of course, now is the time to discuss such problems.

A matter that should be considered at this meeting is the Orthopedic problem. The law which created this Commission states that the Commission should consist of three Lay members, the Secretary of the State Board of Health, and the President of the Medical Association. This does not work out as practically as it might for the simple reason that with each year the new President is confronted with work that is decidedly unfamiliar to him and, since he only meets with this Committee about two or three times a year, he is not given a fair opportunity to familiarize himself sufficiently with the work of the Committee. Beginning this year, the Federal Government is going to match State money for the pursuit of this work. The work of the Commission will necessarily be extended somewhat. Of course, we do not desire to interfere with this law, but it must be possible to so arrange matters that the President of the Association could appoint an alternate to meet with this Commission and such an appointee should be chosen from among members of the Association and should be one who is particularly interested in this work, and willing to continue on from year to year in this capacity.

Another important matter for our consideration is the one of Liability Insurance. This problem has become more complicated than in the past, the increased number of malpractice suits has brought about an increase in the premiums. The Insurance Companies formerly regarded professional liability insurance as a very desirable type of business because of the profit to be derived from it, but *now* the situation has changed and this type of insurance is being carried by them almost at a loss. And it is only because doctors as a class are outstanding members of their community and because the Companies, therefore, desire their good will that they carry this Insurance. Any one who has given this subject any thought at all knows that we are not in the position of some of the greatly populated eastern states who are attempting to have their State Societies carry their own risks. With our State Society enrollment, I fear that one suit would consume our entire funds. Therefore, I believe that for our best interests we should affiliate ourselves with one outstanding company and one that has a charter to do business in this state and whose offices and local legal talent is ready to be called upon just as soon as needed.

There has been considerable feeling among many of the men regarding the time of our annual meeting. A great majority of them feel that July is not the ideal time, but I believe we should have a written ballot with the signature of the voter on which will be stated the month that the voter believes would be best suited for our annual meetings and then the votes could be counted and the majority votes would be used as an index to the desires of the organization. Of course, we should absolutely bear in mind the slackest season, weather and roads and time for accessible material for the program. But, whatever action we take, it should absolutely represent the desires of the majority and this can only be accomplished by a written vote from every member of this society.

I believe I have covered the things that have come to my notice and I sincerely hope that we can forge ahead steadily for the best interests of our association and therefore for the best interest of the public with whose health we are entrusted.

RESPONSE TO ADDRESS OF WELCOME

Vice-President of Medical Association of Montana

H. J. McGregor, M.D., Great Falls

In behalf of the Medical Association of Montana it is, indeed, a pleasure to say a few words in response to a welcome from the President of the Yellowstone Medical Society.

We, Members of the State Society, are well aware of the many hazards that have faced us in the past. We also realize the many obstacles of obstruction which at times have appeared in the role of bringing destruction to the profession in Montana. We know that in all these difficulties of the past we have always had a well-organized, loyal and substantial spoke in the State Society wheel of progressive medicine in the representatives of the Yellowstone Valley Society, who are serving us as hosts this year in this beautiful city of Billings.

In an analysis of the history of medicine from the time of its foundation, I believe there has never been a period in which the profession has looked forward to as many problems as in this present day. Many of these problems are self-inflicted and it will be our duty to lend every possible effort in establishing a proper policy for the profession in this State, as well as in the entire Country, for its future welfare. The period of depression is not only bringing about changes in the economic structure of our Country, but is also greatly influencing the economic welfare of medical practice. The economic changes being brought about call for the administration of Government and business from a humanitarian standpoint. When the Government seeks its level from this standpoint, there is only one profession to which it can come for advice and that is our own because the fundamental principle which underlies the work of the medical man is entirely one for the good of humanity. Our Relief problem was difficult. There is no question but what social security will have to be established in this Country. This is of vast importance to each and everyone of us. It must be met with a united medical profession, one devoid of deserters within its ranks.

To accomplish this the profession as a whole will and must interest itself in the body politic of our State and Nation. We have arrived at a point where we realize that we have been negligent of the political structure of our Country. We have learned that by this negligence we have allowed usurpers in the form of various cults to impose upon our standing with the people of both State and Nation. Right here in Montana, at our very doors, at the last Session of the Legislature this was exemplified by the famous Osteopath Bill. There wasn't, we learned, a single physician member of the Legislative House to assist us in an attack upon ourselves. There were, however, Osteopaths and Chiropractors represented in that House as Members. This has proven conclusively to me that the Medical Profession will never again allow such a condition to exist, and that we will interest ourselves more and more in the body politic as a benefit to ourselves and also convey our scientific ideas to others in need of them, in order to formulate better laws, effect a better social security and thereby do our bit in the economic reconstruction of this State and Nation.

I have made many contacts with Doctors during the past year. I have been using their opinions and their advice in the expenditure of many millions of dollars during the past year and I have found it ever reliable and given with a willingness. Many of these Doctors have expressed an intention to take a more active part in the political structure of our Cities, Counties and State in the future. I have said many times that this Country spent its first hundred years of Government in the hands of statesmen and has spent the past fifty years of its Government in the hands of legal authorities and now we have arrived at a point where it has become a hygienic problem and can only be handled properly by and with the help and advice of the Medical Profession.

To accomplish a satisfactory solution of our problems, one of our first duties will be to clean our own house. We have in our midst many who have brought about difficulties by their antagonism toward their fellow practitioners. This, if allowed to continue, will change our obstructive problems into destructive ones, therefore we must bring about every possible effort to unite for a common good. We must live up to the rules and regulations formulated by the majority thereby taking our rightful place amongst the masses.

In these problems we have always had the helping hand of the Yellowstone Valley Society. Its personnel has been of such character that at times without its support the result would have been disastrous. We are glad and honored to be here in the midst of such a representative organization and we hope our deliberations will result in spreading throughout the entire State the same professional loyalty which exists in the Yellowstone Valley Society. We thank you for your efforts and sincerely hope that when we leave we will warrant the efforts you have put forth.

MEETING
of the
MEDICAL ASSOCIATION OF MONTANA

Billings, Montana, July 8, 1936

NEWER METHODS OF DIAGNOSIS AND TREATMENT OF PNEUMONIA

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Pneumonia now occupies third position as a cause of death in the United States, following closely after heart disease and cancer in the order named. While pneumonia is often a terminal infection among the aged, lobar pneumonia is an important cause of sickness and death among the young and those in the prime of life. Three out of four pneumonia deaths occur before the age of sixty-five and Types I and II, comprising over forty per cent of all pneumonias, are most prevalent before the age of sixty.

In this lies a challenge to the public health, calling for the utmost resources of medical science, and medicine has accepted the challenge and has marshalled its forces for a battle that, it is to be hoped, will bring a victory comparable to that won against smallpox, diphtheria, and typhoid fever. The basis for this new attack on pneumonia is the same as that which lead to the first successes against diphtheria, namely, specific therapy.

In 1931, a pneumonia study was organized in Massachusetts through the aid of the Commonwealth Fund, in co-operation with the State Department of Health, the State Medical Association, and the Harvard School of Public Health. The work of Park in New York and of Felton in Boston served as a scientific foundation. Recently there has been published a book on "Lobar Pneumonia and Serum Therapy" by Lord and Heffron, embodying some of the results of this study.

This year, there was organized in New York State a pneumonia project sponsored jointly by the Medical Society of the State of New York, the New York State Department of Health, the Association of Public Health Laboratories, the Commonwealth Fund, and the Metropolitan Life Insurance Company, working through an Advisory Committee, of which Dr. Russell L. Cecil is Chairman.

The following material endeavors to present the high lights of the accomplishments of these two pneumonia campaigns and is here presented in conjunction with a pneumonia exhibit which was presented at the recent annual meeting of the New York State Medical Society and elsewhere. This exhibit, I might say, is not static but is being enlarged and brought up-to-date from time to time.

Laboratory research has shown that there are at least thirty-two types of pneumococcus and that Types I, II, and III are the most frequent cause of pneumonia and Types I and II are the most important for the young and middle aged. The fact that there are so many types of pneumococcus complicates satisfactory treatment for the individual pneumonia patient.

As long ago as 1910, anti-pneumococcii serum was developed in Germany. The serum was specific for the type of pneumococcus used in developing it. The dose was large and difficult to administer. Felton, working at the Harvard School of Public Health, was successful in 1924 in concentrating and purifying the serum, which is obtained from horses, so as to obtain a high potency, and relative freedom from reactions, with a small dosage. The serum is administered intravenously.

The various serums that have been developed for pneumonia treatment are each specific for its own type. So far, the most effective serums have been developed for Types I, and II; Type III is as yet not very effective and several serums have been or are being developed for other types.

Obviously, the ordinary clinical diagnosis of pneumonia is not sufficient to employ specific treatment properly. It is necessary that the physician ascertain which of the various pneumonia organisms is present and, furthermore, time is a very important factor. The earlier serum treatment can be established, the more successful it will be and if delayed after four days, its usefulness is greatly diminished.

This necessity for recognizing which type of pneumococcus is responsible for any case of pneumonia has resulted in the development of a test known as the Neufeld test, a sputum typing test. A small loopful of sputum is smeared on a glass slide and two loopfuls of undiluted rabbit anti-serum and two loopfuls of Loeffler's alkaline methylene blue are added and thoroughly mixed. The oil immersion lens is used and in a few minutes, if the test is positive for the type tested, that is, if the type of pneumonia in the sputum corresponds to the type serum employed, the capsules of the bacilli appear much swollen and unstained. If sputum is not available, the throat may be swabbed, the swab dropped into a test tube containing two to three cc. of sterile glucose broth and incubated for four to six hours and the Neufeld test is then applied.

Sputum typing is a laboratory procedure and that is one of the complications of specific treatment for pneumonia in that it necessitates the availability of laboratories to render this service to the physician. Here is a situation that can be met through the co-operation of the State Department of Health, hospital laboratories, and the State Medical Society. Through such co-operation, the provision of these diagnostic facilities for the physician can be made practical. In this manner, over a hundred diagnostic centers have been developed in New York State, mostly in hospital laboratories.

Lord and Heffron stress the necessity of taking every precaution before administering pneumonia serum to determine whether the patient has any history of allergic reactions and also testing for sensitivity to horse serum by skin or eye test. Actually, the danger is small.

I will not attempt to quote tables or figures but urge you to consult the pneumonia exhibit which portrays in graphic form certain recently acquired information about pneumonia together with tabulated results of specific therapy obtained from the records of a number of physicians specializing in the treatment of pneumonia.

The situation with respect to specific pneumonia therapy is in some respects similar to that of diphtheria some years ago. It cannot be said that we are on the threshold of establishing pneumonia prevention on a scale similar to that of diphtheria but the results so far obtained promise a considerable degree of success in reducing mortality by early specific treatment.

That this new form of treatment may have practical application, several procedures are necessary. First, the physician must be informed. Second, the facilities which he needs must be made available. Third, a campaign of education must be addressed to the public, for their co-operation is essential. Fourth, there are certain phases of the problem which involve the nursing profession and public health nurses. In addition to the foregoing, continued research in pneumonia must be maintained.

Both in Massachusetts and New York, the Pneumonia Committees, under the leadership of the medical profession, are concentrating on these four points of attack. Reaching the medical profession comes within the province of the State and local Medical Societies. Pneumonia symposiums have been held by State and local Medical Societies and special informative articles by physicians for physicians have been prepared, published in medical journals, and reprints distributed in large numbers among the medical profession.

At first there was doubt in the minds of the physicians and Health Department officials as to the advisability of publicizing the specific treatment of pneumonia, fearing that it might not only give rise to unduly optimistic expectations but also might create a demand from the public which could not be fulfilled. As the pneumonia campaign progressed, opinion on this point changed and accordingly the sub-Committee on Lay Education decided that simple forthright statements on the use of Type I serum, in appropriately typed cases, should be included in the material prepared for the public.

As part of the statistical and research activities of the New York Pneumonia Advisory Committee, the State Department of Health, through the District State Health Officers, investigated cases of pneumonia in the same families and a detailed study was made of 31 secondary infections reported in the month of January. Of the 31 cases, 25 were found to have occurred in the same households. In these 25 households, there were 60 cases of pneumonia, 43 lobar and 17 broncho. There were 143 individuals in these 25 households, making the attack rate 42 per cent. There were nine deaths, a fatality rate of 15 per cent, but most of the cases were children. I mention this item from the Progress Report of the Advisory Committee not only because it emphasizes the contagion of pneumonia but the opportunity that it illustrates for doing intensive preventive work.

One of the factors contributing to the pneumonia death rate is that the doctor does not get to the patient soon enough. Here the nursing organizations can play an important part. The public health nurse, whether she works for official or private agencies, comes into contact with the families of the community and is, therefore, in a position to urge calling the doctor when pneumonia symptoms are present. A Nursing sub-Committee of the New York Pneumonia Committee has prepared a handbook on the nursing care of pneumonia, a most useful and practical contribution to this subject.

Adequate nursing care in pneumonia is important. Our own experience, both in the East and in the West, indicates that about 50 per cent of fatal cases of pneumonia had no skilled nursing care, even when such care was available through visiting nurse associations or our own nursing service. Pneumonia strikes quickly and all too often nothing is done until the patient is critically ill—then the doctor is called too late for effective treatment. One of the prominent medical members of the Massachusetts Advisory Committee made the statement that if intelligent use of visiting nursing service was made and the doctor called in, on the average, a day sooner, that alone would help towards bringing about a decline in the mortality rate. For that reason, we have prepared a leaflet, the text of which was prepared by the State Medical Association, for distribution throughout the community during the pneumonia season for the purpose of educating the people to call the doctor early when respiratory infections make themselves manifest.

F. L. WATKINS, M.D., GREAT FALLS

President Montana Health Association

No history is more interesting than that of Public Health itself.

Petersburg, Va., was the first to establish a City Health Department, in 1780. No state departments of Health were created until that in Massachusetts in 1869. It is rather interesting to note that "ship quarantine" laws were adopted in 1700 and at this time New York City with a population of approximately 75,000 people had a Public Health Committee, which were concerned with:

Pure water supplies.
Construction of common sewers.
Drainage of lowland marshes.
Interment of dead.
Construction of masonry along the water front.
Planting of trees.
Healthy vegetables.
Habitation of damp cellars.

It was rather significant that at this early date the pure water supplies were mentioned. Almost a century prior to this time regulations in Boston were made regarding fumigation and disinfection. Most efforts of Health Departments directed control of epidemics and during this time only one of which they had scientific knowledge with which they could combat it—I refer to Smallpox. Vaccination against this disease had been established in 1796.

The first Public Health Meeting was held in Philadelphia in 1857. This meeting antedated Massachusetts State Board of Health 12 years. With the Civil War in the offing at this time no further meetings were held until 1872, at which time the A P H A at Long Branch, New Jersey, in 1872. The first annual meeting was held the following year in Cincinnati, Ohio, at which meeting the following Declaration was made:

1. Public Health Education.
2. Vital Statistics—race and nationality. Urban and rural factors in relation to mortality.
3. Germ theory of disease.
4. Epidemiology of Typhoid Fever, particularly with reference to water supplies.
5. Control of specific diseases:
   Smallpox.
   Yellow Fever.
   Cholera.
6. Quarantine and Disinfection.
7. Water purification—street cleaning and scavenging.
8. Organization of State, Local and National Boards of Health.

This declaration regarding the germ theory of disease antedated about three years the discovery of Anthrax-bacillus the first micro-organism identified. The reference regarding epidemiology of Typhoid Fever preceded by seven years the discovery of Typhoid bacillus. The discovery of the specific organisms of various diseases was the beginning of real intelligent Public Health Work. Along with the discovery of these specific organisms followed a discovery of immunization against anthrax—1881—Rabies—1885, were advanced steps. This was followed in 1890 by an antitoxin for both Diphtheria and Tetanus. Typhoid vaccine in 1898 and Schick test and Toxin-anti-toxin, 1913. Diphtheria Toxoid in 1921.

A Nation-wide survey made in 1930 revealed that only 21 per cent of city children and seven per cent of children in rural sections, had ever been vaccinated for Smallpox before their sixth year of age. Yet, at that time vaccinations had been available for *134 years*. This same survey relates that only 21 per cent of the city children and 18 per cent of children in rural communities have been immunized against Diphtheria. Yet the immunizing agent for this disease has been available for *23 years*.

A review of these figures makes one wonder whether or not Public Health Departments have failed in their education of the people regarding these two diseases. This same survey informs us that only 51 per cent of the city children and 37 per cent of rural children have had one or more health examinations prior to their sixth birthday. And during this same period of their life only 13 per cent of all have had a Dental Examination. This makes a rather gloomy picture, but there is a brighter side, when we review the figures of some communities that through immunization against Diphtheria that the disease is a rarity. This is not altogether true of Smallpox.

Our infant death rates have been reduced materially. This has come about largely through the improvement of water and milk supplies and the mother's understanding that sterilization of all articles used in the feeding of infants. The saving of infants' and children's lives from intestinal infections has resulted in increasing our average age at death very markedly during the past 30 years, while our average age of death has increased. The people in other age groups are dying at earlier age—this increase is mostly due to Heart Disease, Cancer and Chronic Nephritis.

An annual examination of adults would mean the prolonging of many of these lives, and the prevention of others. Much educational material has been made public in the lay-press the last several years concerning cancer, stressing the fact that an early diagnosis and treatment as the only means of combating this disease.

Much misery and many deaths are caused by venereal diseases. Recent figures issued by the Surgeon General of the U. S. Public Health Service with reference to syphilis are appalling, and if we were to have full data on all deaths where syphilis is a factor we would probably find this disease to be of greater interest to us from a Public Health standpoint, than many of the diseases that are quarantined and isolated. One leprous person can create more excitement and fear than tens of thousands of cases of syphilis. Since syphilis and gonorrhea are communicable it is my opinion that we will make very little headway in the control of either until such time that these diseases are required to be reported and are handled in just the same manner as any of the other communicable diseases. Whenever we are able to educate the public to realize the real significance and remove the "taboo" that has been placed on venereal diseases we will then be able to reduce the incidence of these diseases. There are striking examples in the world today of what may be accomplished in combating these diseases, when we stop to think that we are spending $29.00 for treatment of disease for each DOLLAR that is spent in prevention of disease—or in other words that only three cents (3c) out of each Medical Dollar is spent for prevention, it naturally causes us to wonder what the future holds for us.

MANIFESTATIONS OF ALLERGY IN GENERAL PRACTICE*

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I shall attempt to discuss some of the allergic conditions that come under our observation frequently, but which do not receive the attention that they merit. These symptoms may be located in any organ of the body and may simulate many organic conditions. In the nose in particular allergic reactions may cause so much swelling and obstruction that the patient often goes to the surgeon for relief. If these cases are operated they will have a recurrence of the same symptoms and then will return to embarrass the surgeon who operated upon them. It is quite important for a good diagnostician to recognize allergic conditions when he sees them, and to understand the mechanism involved as well as the therapeutic procedures necessary to secure amelioration of the symptoms.

The allergic individual has an altered tissue reaction to an allergen, which may be a food, drug, inhalant or article in the environment which is harmless to a normal individual. The organ which reacts abnormally is the shock organ for that person, and it determines the nature of the symptoms. Thus if egg white is the antigen and the skin is the shock organ the patient will have a dermatitis or eczema, but if the lung is the shock organ and the egg white is the antigen the patient will have asthma. The allergic reaction is a specific reaction and can be compared to the Widal agglutination test between typhoid bacilli and antityphoid serum. The Mantoux test used in the diagnosis of tuberculosis is an example of an allergic reaction. If a person has had tuberculosis at any time in his life the skin has become sensitized to tuberculin. Later if a small amount of tuberculin is injected intradermally into such an individual an antigen antibody reaction takes place within 48 hours resulting in a local indurated erythematous area.

Allergy is closely related to anaphylaxis in animals, in that both conditions are due to hypersensitivity, usually to a protein. In anaphylaxis the hypersensitivity is acquired artificially by a previous injection of a sensitizing dose of serum. A second injection of the same protein two weeks or more later may cause anaphylactic shock and death due to tetanic contractions of smooth muscle in the body. This takes place in the body tissues, and is probably due to the violent reaction that takes place between the antigen and the antibodies in the tissues. The antibodies were formed from the injection of the antigen or protein two weeks previous. This is a very specific reaction. In allergy the hypersensitivity is naturally acquired by repeated exposure to the same antigen. The tendency to become sensitized, or the allergic predisposition is inherited, but the specific reaction is acquired by repeated exposure to the antigen.

In connection with anaphylaxis the Schultz-Dale phenomenon is instructive. If you take out some smooth muscle, such as the uterus from an animal, and suspend it in Ringer's solution connected to a lever and then add 2 c.c. of the serum to which the animal has been sensitized, the muscle will go into a tetanic contraction which will last about ten minutes. Wait another ten minutes and repeat and then nothing will happen. The antibodies which had formed from being sensitized had been used up by uniting with the antigen in the serum from the first dose. There were no more antibodies to react with this second dose of serum and, therefore, nothing happened. This experiment explains the mechanism of death from anaphylaxis. It is important in the administration of antitoxins as a previous injection of serum may have sensitized the individual and antitoxin given to such a person may result in an anaphylactic death. Such sensitivity may be tested by the intradermal and conjunctival tests.

The Arthus phenomenon is another interesting observation made in this connection. If you inject a rabbit daily in the same area with 2 c.c. of horse serum, after the sixth injection the local area becomes indurated and goes on to a sterile necrosis. This is due to an obliteration of the vessels in the tissue. It is an antibody-antigen reaction.

If a filtrate of toxins free from bacteria is injected into the abdomen of a rabbit and 24 hours later some of the same filtrate is injected intravenously to the same rabbit there will appear a hemorrhagic necrosis at the site of the abdominal injection. This is due to a reaction of the toxin injected with the sensitized tissue at the site of the previous local injection of toxin. If antitoxin is injected into the local area preceding the intravenous injection no necrosis or lesion appears. This is Schwartzman's phenomenon.

Serum sickness is another allergic phenomenon from the injection of a serum. Hives, itching, urticarial wheals and edema come on the skin from five to six days following the injection of whole serum. They may come out in crops or separate attacks due to several different proteins in the same serum each having a different incubation period.

It has been estimated that there are about a million asthmatics and between two and three million hay fever cases in the United States. In addition there are an indefinite number of others suffering from various forms of allergy. The mortality from allergy is small yet the economic loss of time from work and the discomfort and inconvenience of these patients make it well worth our time and study to help alleviate these individuals.

The potential allergic is an individual different from his fellow man. This difference is of a constitutional nature since it is inherited from one generation to another. In about 60 per cent of allergic cases we can trace the presence of allergic disease in other members of the family. If the female is the transmitter there will be twice as many allergic individuals in the offspring than if the male is the transmitter. The stronger the allergic tendency in the family, the earlier in life the allergic symptoms are apt to occur. The specific sensitivity is not inherited but the allergic tendency is inherited. The grandparent may have asthma due to feathers, the parent may have migraine due to chocolate and the child may have eczema due to egg white. They all have the allergic tendency or the ability to become sensitized, but each is sensitive to a different antigen, and each has a different shock organ.

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The allergic individual must become sensitized to a particular substance, usually a protein, but sometimes other factors such as drugs, heat, cold and light are the allergens. The threshold or tolerance of a patient will also vary, so that a small amount of chocolate may not produce a migraine, but a larger dose will. This tolerance or threshold will vary from time to time and under various conditions affecting the individual's health and well being. For instance, an individual sensitive to feathers and having asthma may sleep on his feather pillow night after night without any symptoms until the incidence of an infection such as a cold may lower his threshold of tolerance. This is a secondary factor, but quite important. An individual may have asthma from eating eggs, still does not get asthma until he goes out in the cold air, or it may get worse then. These secondary factors are usually either mechanical such as dust, or chemical such as gasoline, or turpentine, or thermal such as exposure to heat or cold, or infections such as sinusitis and bronchitis or neurogenic such as excitement due to family troubles. Thus an individual may get asthma when his or her wishes are interfered with. The boy who broke out with hives every time he was whipped, and the girl who got asthma every time her mother scolded her are examples of secondary neurogenic factors.

The constitutional factor is the underlying inherited condition by which the individual is capable of becoming sensitized to some substance. Hence, it is first necessary to become sensitized to the substance and then again become exposed to that substance before an attack is possible. If he is exposed to a dose below his tolerance he will not get an attack, but a larger dose will give him the attack. Bakers often become sensitized to wheat from daily inhalation of wheat dust.

The number of substances capable of causing hypersensitiveness is practically endless. Most of them, however, may be classified into a few general groups, such as foods, epidermals of animals, pollens, bacteria, fungi, and miscellaneous things such as orris root, usually found in cosmetics, pyrethrum, often found in insect powders, cottonseed found in dry dust from dried cottonseed in mattresses or cottonseed oil used in cooking, glue from stamps, flaxseed, wood, organic dyes and house dust. Molds and yeasts are often found to be the cause of allergic diseases. Harkovy in New York reported a case of sciatica due to allergy to beer. Arthritis is frequently due to an allergy to certain foods. Some patients have asthma and rheumatism alternating. Gout is often allergic due to wines or liquors. Colitis is very often allergic. Drugs are frequently the cause of allergic manifestations. I have two patients sensitive to aspirin, and one aspirin tablet given to either one will produce such a severe attack of asthma that neither morphin nor adrenalin hypodermically will relieve either one, and it will take nearly a week for the attack of asthma to subside. Senna is a frequent cause of angioneurotic edema and hives. I have seen exfoliative dermatitis produced from a single rub with chloroform liniment used in a case of lumbago. Arsenical exfoliative dermatitis is a common form of allergy. This is not to be confused with idiosyncrasy to drug. Idiosyncrasy constitutes such examples as ringing in the ears from small doses of quinine or a rapid heart beat from minute doses of belladonna. These are merely the usual pharmacologic effects of the drug if used in larger dosage. In allergy the reaction is an abnormal one, different from the pharmacologic reaction. Thus an urticaria from belladonna is due to allergy, not idiosyncrasy, but a tachycardia is due to idiosyncrasy. In regard to drugs it is interesting to note that cutaneous tests are negative, even though clinical symptoms may be very severe.

When a patient presents himself with symptoms suggesting allergic disease we must first rule out organic disease in the nature of gross pathology. The history of an allergic background in the family history is important. Eosinophilia is important. Next is the presence of positive skin tests. To determine the specific cause, skin tests are very important.

The cutaneous skin test is usually the method of choice. It consists of applying some of the powdered extract, paste or liquid extract to the skin of the arm and making a light stroke on the skin, about ⅛-inch in length, with a sharp scalpel or cataract knife and then moistening the powder with n/20 sodium hydroxide. Twenty to forty tests may be made at one sitting. A positive reaction consists of an urticarial wheal with a surrounding zone of erythema and usually some itching. It usually occurs in from five to thirty minutes, but occasionally a delayed reaction may occur as late as forty-eight hours. A positive reaction signals a hypersensitivity to that allergen, not necessarily the cause of the particular symptom the patient came to seek relief. The degree of the reaction does not necessarily mean the relative importance of the offending substance, as a small reaction to feathers in an asthmatic may be more important than a strongly positive reaction to tuna fish which the patient may not eat once in two years. I prefer the powders to pastes and liquid extracts of proteins. The cutaneous test is reliable, safe and relatively free from danger.

Intracutaneous tests are used routinely by some allergists and others use them only after getting negative tests with the cutaneous method. There have been a few deaths from intracutaneous testing in highly susceptible individuals, and this must always be considered by anyone doing intracutaneous testing. There is also a possibility of obtaining false positive reactions by this method. This method consists of the injection of about 0.02 c.c. of 1 to 1000 or 1 to 10,000 dilution of liquid extract intradermally on the skin of the arm and reading the result of the test in about ten minutes. The reaction is similar to the cutaneous method. The amount of the skin reaction is not related to the amount of sensitization and is no criteria of the degree of sensitivity. Some normal persons may have positive skin reactions and not have allergic symptoms. These individuals do not as yet have a shock organ and are, therefore, known as potential allergics, and will probably be allergic later in life if the proper predisposing conditions arise.

Rarely it may be necessary to do a nasal or conjunctival test which consists of putting a minute amount of allergen or substance to be tested in the nose or conjunctival sac and wait for sneezing or conjunctivitis to appear, in positive cases.

In 1921 Prausnitz and Kustner succeeded in demonstrating a specific substance in the serum of allergic individuals which was called the allergic reagin or the atopic reagin. They were able to demonstrate this by local passive transfer. This was accomplished by taking a small amount of serum from a person having a hypersensitiveness to some antigen and injecting it intradermally into some person not sensitive to this antigen. After 48 hours the skin in this area is tested as well as an adjacent area of normal skin, and the area of passive transfer will react to the antigen, while the normal skin does not react. This demonstrates that the reagins from the allergic individual were transferred by the intradermal serum to the dermal tissues of the new host, and that this area can be used for testing the patient's sensitivity. This area can be tested daily for several weeks. It is a valuable method to use in the case of testing children or patients with a very sensitive skin, as their serum can be injected into some normal person and then the tests can be made on a normal adult instead of on a restless child or a person with a very sensitive skin.

In dermatitis due to a contact the most reliable test is the patch test. This method consists of placing a small amount of the allergen or substance to be tested on the skin and covering with gauze and oiled silk and taping with adhesive for 24 to 48 hours. A positive test appears in the form of a dermatitis with erythema and a negative test shows no change in the skin. Another test used in contact dermatitis is the abrasion patch test. This method consists of making an abrasion on the skin and then applying a patch test over the abrasion. After 48 hours remove the patch and a positive test consists of a red papule.

Another method of testing a patient's hypersensitivities, especially in gastro-intestinal allergy is by means of the elimination diets, the most common ones being those outlined by Dr. Rowe of San Francisco.

About 400 normal individuals in New York City were tested by Dr. Harkovy using the intradermal test, and using tobacco, horse serum and ragweed as the antigens. He found that 48 per cent of these normals reacted to one of the allergens and 10 per cent of them reacted to tobacco. Twenty-seven per cent of these had a family history of allergy. These normal persons probably have a high tolerance threshold and, therefore, seldom have symptoms. Probably many of our vague headaches, backaches, gastro-intestinal upsets and other vague sicknesses are manifestations of allergic diseases.

As an internist I cannot attempt to add anything to the contribution on the anatomy of the nose or paranasal sinuses. Neither can I even discuss the various operative procedures which have been perfected by eminent men in the field of otolaryngology. However, I do feel that the allergic symptoms of the nose and paranasal sinuses have not had the scientific study and research necessary to establish better methods of diagnosis and treatment.

It is interesting to note that as long as 45 years ago several observers in the German literature described in detail the typical pathology of allergy as it involves the nose and paranasal sinuses, such as edema, eosinophilic infiltration in nasal polyps and the presence of eosinophiles in the nasal secretions in asthma, hay fever and spasmodic coryza. However, as far as practical use of these findings is concerned, no value was attached to them until a few years ago when clinicians began to distinguish between infections, allergic manifestations and combinations of infection and allergy. The failure to consider allergic disease has resulted in many unsatisfactory operations on the nose and paranasal sinuses.

Normally the nasal mucosa supplies moisture and heat to the inspired air. This function is accomplished by large and numerous blood vessels in the turbinates and nasal mucosa. It has been estimated that from 12 to 18 ounces of water is secreted daily. The mucosa also acts as a filter and various particles in the air are deposited somewhere in nares as the air has to circulate through the nose on its way to the trachea. It has been estimated that at least ¾ of the bacterial content of the inspired air is deposited on the mucosal surface of the nares. This foreign material is disposed of through the action of the cilia with the protective layer of mucus.

Disturbances in the physiologic function of the nose may be greatly exaggerated by anatomic abnormalities such as hypertrophy of the turbinates and deflections of the nasal septum. However, symptoms may be due to environmental conditions such as watery discharge in cold weather. The rhinologist must decide whether the symptoms are due to anatomic deformities or to environmental conditions. Sometimes the allergic condition may be so mild that it is difficult to differentiate from the normal. It is these cases that require an investigation from the allergic standpoint to complete the diagnosis.

Case Reports

Allergic Rhinitis:

1. Dr. L. S., an M.D. in a CCC camp, was referred to me on January 11, 1936, with a perennial rhinitis of about two years' duration. History reveals that his symptoms have been worse at night. He did not believe his condition was allergic. Cutaneous tests were strongly positive to cottonseed, duck feathers, camel hair and pepper. He slept on feather pillows and wore a camel hair coat. The coat was discarded and allergenic encasings were ordered for his pillows. On February 9, he reported that his symptoms had all disappeared and in addition a chronic lumbago, which had been present for years, had also disappeared. On April 4, he again reported that he was still well.

2. L. E. D., age 57, has had a sniffling and running nose for a period of two years. In May, 1935, he had a sub-mucous resection with no relief. He reported to me on March 21, 1936, and I made a number of cutaneous tests and found him positive to feathers, kapokseed, dust and dog dander. I also found positive reactions to several pollens. A pollen treatment set was made up and he was given treatment for the hay fever. Allergenic encasings were provided for his pillows. His symptoms have all cleared up.

L. E. D.—Case of allergic rhinitis. Positive intradermal test to feathers. Several negative tests visible.

3. Mrs. M. was referred to me by Dr. Murphy with a diagnosis of allergic rhinitis. She had had a chronic sniffling and watery discharge from her nose for several years. In addition to this she had been troubled with mucous colitis for a period of several years and had been taking medicines and following a diet with very little results. She was tested with inhalants and foods intradermally and found to be sensitive to feathers, dust and several articles of food including tomatoes and beets, both of which she ate practically every day of her life. She was given allergic encasings for her pillows and told to avoid the foods to which she re-

acted. Her nasal condition has entirely cleared up and she has no more abdominal symptoms. She can produce an attack of mucous colitis by eating tomatoes or beets and her nose will immediately begin to discharge if she sleeps on feather pillows. She recently took a trip on the train and took her allergic encasings along so that she would not have to sleep on a feather pillow on her trip.

Allergic Conjunctivitis:

1. C. S. W., age 68, tinsmith, had a blepharitis of 18 years' duration, diagnosed allergic by Dr. E. S. Murphy. Cutaneous tests all negative. During the examination I learned that he worked in fumes of muriatic acid daily. A patch test with weak muriatic acid was strongly positive. He was given a rest for a month at home and his eyes cleared up without any medication. Then he returned to work and in five days the conjunctivitis re-occurred. Then he quit work and his eyes cleared up in a few days. He was advised to stay away from muriatic acid fumes and on April 25th, he stated his eyes were the best they had been in 18 years.

2. M. M. was referred to me with a diagnosis of conjunctivitis of about two months' duration. Cutaneous tests were applied and she was found markedly sensitive to sheep wool. Then it was discovered that she had been wearing woolen gloves beginning at the time of the onset of her conjunctivitis. The gloves were discarded and her conjunctivitis cleared up immediately.

3. J. A., age 12, had not been able to go to school during the past year due to what had been diagnosed conjunctivitis. There was a muco-purulent discharge from the eyelids with a sticking together of the lids each morning. His eyes were very sensitive to light and for this reason he wore goggles, with colored glass. Examination of his nose showed very marked congestion of the entire mucosa with obstruction to breathing and a discharge of muco-purulent material. He was tested with cutaneous tests for pollens, and intracutaneous tests for inhalants and was found positive to large number of pollens, feathers and dust. He is being treated for his hay fever and his pillows have been covered with allergenic encasings and he is definitely improving.

Asthma:

1. G. W., male, age 12 years, has had asthma since a baby. Recently was so bad and constant that his parents took him out of school. Cutaneous tests were applied and reactions were positive to the following: goat hair, camel hair, kapok, duck feathers, chicken feathers, rat hair, rabbit hair, mohair, orris root, pyrethrum, pepper and tomatoes. He had a pet rabbit which was given away. He also had a mohair robe which was disposed of. Allergenic encasings were purchased for the pillows. I saw him April 20, five months later, and he said he goes to school, feels fine and has not had any more asthma.

2. R. L. W., age 55, came to me on February 3, 1936, with a history of severe asthma of three months' duration. History reveals he got a cat about the time the asthma began. Intracutaneous tests with cat dander was 4 plus, feathers 2 plus. He got rid of the cat and the feather pillows and his asthma has cleared up. I have a report from him a few days ago that he has not had a single attack of asthma since the tests were made in February.

3. E. J., age 41, miner, came to me on January 2, 1936, complaining of asthma which he has had since 1932 following a radical antrum operation in Portland, Oregon. Also had hay fever badly for many years. During the last three months has had indigestion and bloating in his abdomen. Had been treated for hay fever with pollens for several years with about 70 per cent relief. Physical examination was essentially negative. X-rays of stomach revealed no pathology. Test meal was normal. Fluoroscopic of the colon with a barium enema was normal. The gall bladder was X-rayed and was found to fill and empty normally. Intracutaneous tests gave positive reactions as follows:

Feathers
Kapok
Orris
Dust
Tobacco
Dog dander
Sheep dander
Goat dander
Cow dander
Flaxseed
Horse dander
Milk
Chocolate
Oats

Wheat
Barley
Corn meal
Rye
Rice
Carrots
Cabbage
String beans
White Potato
Spinach
Green peas
Peaches
Crab meat
Cherries

He quit tobacco. His family quit using ordinary cosmetics, now use Mansfield's cosmetics which are free of orris root. He ordered allergenic encasings to cover his mattresses and pillows to avoid inhaling emanations from feathers and kapok. His diet has been restricted to avoid all foods to which he reacts. Adrenalin 1.100 and an atomizer for a throat spray was given him, but on April 17 he reported he had not used it and that he had not had any asthma.

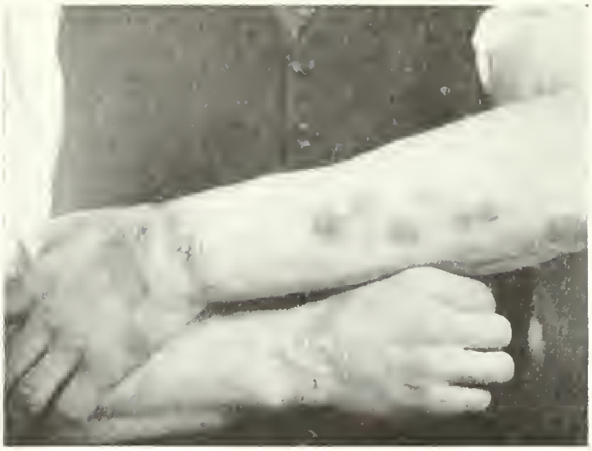
Urticaria:

1. Mrs. E. N. H., age 39, seen March 27, 1936, with severe case of hives. She was brought to the hospital and treated with castor oil, adrenalin and ephedrine internally and menthol alcohol lotion externally. She was put on an elimination diet and left the hospital cured, March 31, but continued the elimination diet adding one food each day. On April 10, she returned with a severe case of hives again but stated she had taken prune therapy the previous day for constipation. Prune therapy is a mixture of prunes and senna leaves. She had taken some of this the day before her severe case of hives March 27, and had never taken senna before in her life. A patch test was applied with prunes and senna. The next day the senna patch was 2 plus and the prune test was negative. She has remained well since she quit using senna.

Allergic Dermatitis:

1. C. R. W., age 48, lineman on a Government irrigation project, came to see me on January 15, 1936, with dermatitis on his legs, neck and face which had been present since August, 1935. This dermatitis was present only on the exposed body surfaces, was moist and weeping in character. A number of patch tests were applied to the normal skin on the back and chest. He had a 4 plus reaction to cat hair. On going into the details of his history I found that he had got a cat in his home about the time the dermatitis began. The cat was eliminated and a month later he reported at my office and informed me that the dermatitis had entirely cleared up.

2. E. J. G., a baker, age 30, was seen April 3, 1936, with a dermatitis on both forearms. In questioning him it was found this began about the time they began using Stacy's Vegetable Oil in place of Mazola. A patch test was applied on his arm with Stacy's Vegetable Oil and twenty-four hours later reacted 4 plus. He was advised to stay away from the bakery and use boric acid ointment to the lesions. On April 22, he

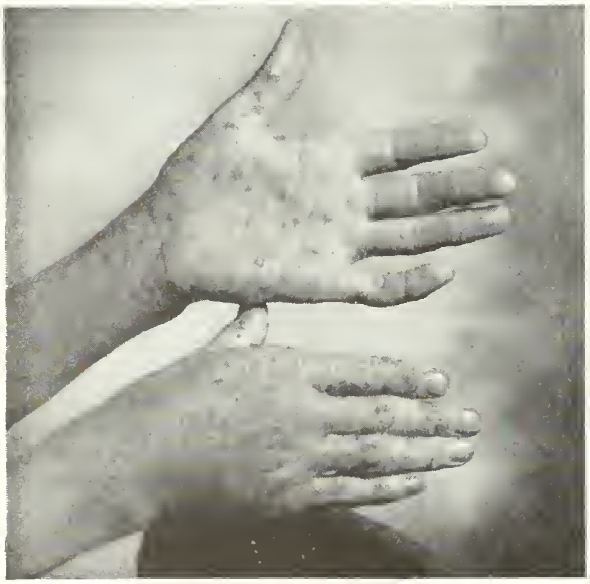


Mr. E. J. G.—Baker. Allergic dermatitis due to Stacy's vegetable oil used in baking. Patch test was positive to Stacy's vegetable oil. The dermatitis cleared up when he changed his occupation.

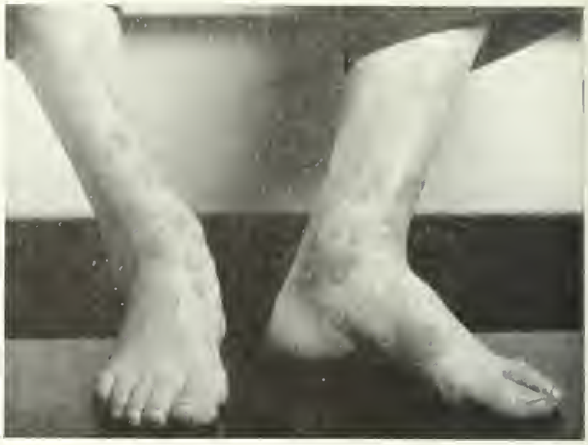
had completely recovered. At the present time he is driving a truck for a store and has had no recurrence of any dermatitis.

3. Dr. E. D. N. has had a seasonal dermatitis for the past thirty years which involves his face, hands and ankles. It comes on in June and lasts until the first heavy frost. Then it takes two or three months until his skin returns to normal. No treatment he has ever had has given him any relief and the diagnosis has been in doubt although he himself thinks it is due to some weed. He is a veterinarian and his work takes him out in the country on farms a good deal. Twenty-three patch tests were applied to his normal skin and in forty-eight hours they were all negative except the giant poverty weed, which was strongly positive. He will receive injections of the poverty weed in the same manner as it is used in the treatment of hay fever. The response to treatment will be interesting to observe.

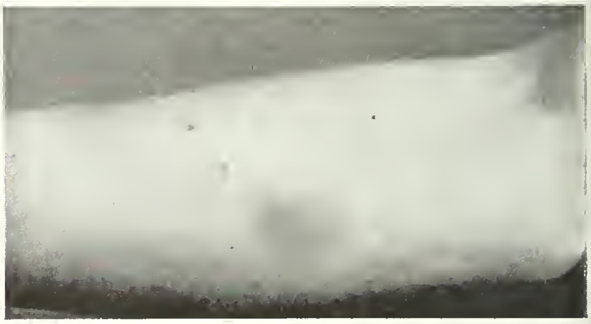
4. Mr. J. D. came to the office with a severe dermatitis on his face, both hands and on his ankles, of about one month's duration. In going into his history I found at about that time he began using lava soap. A patch test was applied with lava soap and in forty-eight hours showed a marked dermatitis at the site of the patch test. He was advised to discontinue using lava soap and in a period of a week he has practically recovered.



Mr. J. D.—Allergic dermatitis of hands due to use of lava soap. Recovered when he discontinued using lava soap.



Mr. J. D.—Allergic dermatitis of feet due to use of lava soap. Recovered after he discontinued use of lava soap. No other treatment.



Mr. J. D.—Positive patch test to lava soap.

Epidermophytids:

1. R. W. was referred to me on February 4, 1936, with a generalized dermatitis of six weeks' duration. He has been treated by several doctors with various ointments, but instead of improving got worse. On examination it was found he had epidermophytosis between his toes. He was given an intracutaneous tricophyton test. In twenty-four hours he had a very markedly positive test. Then he was given desensitizing doses of dermatomycol at five-day intervals. After the eighth dose on March 22, he was cured without any other treatment except permanganate of potassium foot baths daily. To date he has remained well.

2. Age 33, came to my office February 14, 1936, with urticarial wheals over his entire body since last summer. At that time he had swollen feet and itching between his toes. Tricophyton intradermal test markedly positive. He was given potassium permanganate foot baths and desensitized with dermatomycol injections. Several times when taking the injections I gave him too large doses and he would break out with urticarial wheals within half an hour. At present he is apparently recovered.

Medical Education in North Dakota

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THE School of Medicine of the University of North Dakota is one of ten two-year or incomplete schools in the United States. The facilities of the state have never permitted, and do not now permit, it to undertake the work of clinical instruction. It, therefore, confines its efforts to the laboratory medical sciences except for small introductory clinical courses of interest and correlating value. Its curriculum has always been designed to correspond to the first two years of the standard four-year medical course. Its students finishing the curriculum, except as noted below, have always been able to transfer readily and with full credit to larger or complete medical schools. Except for a very few students in the so-called "shorter course" in the first two or three years of its existence, the school has always required for admission a minimum of two years of pre-medical college work including certain definite subject requirements, and a quality requirement as indicated by grades in the pre-medical college work. The quantity requirement was advanced to three years of pre-medical college work in 1935, and the quality requirement to what is called the 1.5 average, or standing in the upper one-half of the class.

The possibility for such a school to exist at all depends upon several factors:

1. Good work, and the ability to do good work. This in turn depends to a large extent upon adequate financial support, permitting a reasonably sized staff or faculty, salaries that can hold and attract good men, adequate department budgets and equipment, and adequate library facilities.
2. Favorable recognition by various rating bodies.
3. The ability of complete schools to accept for clinical or advanced work the students who have finished the curriculum offered in the incomplete schools.

The school has just finished its thirty-first year. In the early years its numbers were very small; in fact, only two degrees (B.S. in the Arts-Medical Course) were given in the first five years of its existence. In the sixth year there were five to complete the curriculum, and the average was 7+ for the next ten years. For the last 15 years the average has been 22. In the same way for the last 15 years the average number to matriculate, or enter the first year's class, has been about 27 (30 for the last ten years), and the total enrollment in the two classes, between 50 and 60. The total number of "graduates" is now 430. Almost all of them have been residents of the state, the sons (421) and daughters (9) of taxpayers, and with few exceptions they have all gone on to complete their medical training, or are still in clinical schools or serving as internes. Change of plans, failure of health, and lack of means have caused a very few to abandon the course; perhaps as many others, who began the study of medicine in the school, have transferred after one year, or failing to complete the two years' work satisfactorily, have still been able to secure some advanced standing elsewhere and to go on.

It should be noted that from three to four years, school and hospital, must be added to the training of a graduate of the school before he is ready for practice. The number of graduates, therefore, who are still living and in practice is considerably less than the figure mentioned above. It is interesting, however, to see that between 65 and 70 are now practicing in North Dakota, that perhaps as many more have been licensed in the state and after variable lengths of time have moved to other states, and that as many more are practicing in the neighboring states of Minnesota, South Dakota, and Montana. This would indicate that a reasonable proportion of its graduates locate either in the state, or in communities where conditions are similar to their early environments. At the same time no one should wish to deny perfect freedon in the choice of location, and surely there is a limit to the desirability of provincialism and in-breeding.

The most important factor in judging the value or the success of any school is the quality and character of its product. To indicate what the students who began their medical training in this school are doing it may be said:

1. Only two of its 430 graduates, who have tried to go on, including one of this year's class who is not yet placed, have ever failed to be able to transfer with full credit for two years of medical work to some other school.
2. Only two who have thus transferred have failed to be able to carry the advanced work and finally graduate in Medicine.
3. No one so far as is known who has gone on to complete the training has failed before a State Board of Medical Examiners.
4. No one so far as is known, whether he completed the course or not, has gone into any irregular form of practice.

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5. Many of its graduates (50 to 60 per cent) have been accepted and have finished their training at Rush and Northwestern. Others in variable numbers have gone to Harvard, Columbia, Pennsylvania, Jefferson, Johns Hopkins, Vanderbilt, George Washington, St. Louis, Washington, Louisville, Nebraska, Colorado, Oregon, etc.
6. To cite the experience of North Dakota transfer students at only one school it may be said that 39 such students were accepted at Northwestern from 1927 to 1934 inclusive; one died in his junior year; the other 38 went on to complete the work and to graduate; 3 in the upper 1/10 of their classes at Northwestern, 13 in the upper ¼, 28 in the upper ½, 8 in the third ¼, only 2 in the lowest ¼.
7. After completing two years of medical training, students in acceptable schools are eligible to write on Part I of the National Board Examination. Students are not required to write upon this examination, and some feel that they cannot afford the necessary fee, but a few, usually representing all levels of scholarship in the class, elect to try the examination in June. In the last five years, 50 North Dakota students have written the examination; thirty-eight have passed in all subjects at once; eight have made partial failures, but most of these have rewritten the subjects in which they were low and received the certificate later in accordance with the rules of the National Board; four have failed. (One that failed and one that made a partial failure had not made the required average and had not graduated.)
8. Twenty-nine graduates of the school are licentiates of the National Board of Medical Examiners. (Directory of National Board, and Supplements to January, 1936.)
9. Nineteen graduates of the school are Fellows of the American College of Surgeons (Directory of 1935). Many are members of other professional organizations.
10. A graduate of the school is head of the Section on Anaesthesia at the Mayo Foundation; another with an international reputation is high in the United States Public Health Service; at least ten are on the staffs of other medical schools; four who have completed their training elsewhere have some part in the work offered here.

That the physicians of the state have confidence in the work of the school is indicated by the fact that nine, or fifteen per cent, of the students in attendance in 1935-36 were sons of doctors; the percentage has always been about the same. Forty-three of the physicians now practicing in the state have had sons in the school at some time, and as many more have had brothers or proteges.

The demand for admission to its classes, as in all medical schools, has long been far greater than the capacity of the school. About 300 non-resident applications have been received each year for the last six years, and only a few less for many years before that. Non-resident applicants are simply notified that they cannot be provided for, and that they must not come to North Dakota to begin the study of medicine. In the same way, particularly in the last six years, the demand for admission on the part of North Dakota applicants has been from 50 to 100 per cent greater than the facilities of the school would permit. After a few early applications have been withdrawn, however, and after a reasonable quality requirement has been invoked, it has seldom happened either that the entering class has exceeded 30, or that any promising North Dakota student who should at all be encouraged to think of medicine has been denied admission. Preference has always been given to applicants from the state; the next groups in order of preference have been students from western states in which there are no medical schools, and students, particularly from neighboring territory, who have taken their pre-medical college work at the University. No applicant from North Dakota who should at all be encouraged and who applied reasonably early has ever failed to secure admission because of the presence of non-residents. The transfer to this school of students who have begun the study of medicine elsewhere has always been discouraged. Special considerations have led to the acceptance of only ten such students in the history of the school.

The ideal in medical education in North Dakota means neither a complete school nor increased facilities simply from the point of view of taking care of greater numbers of first and second year students. The desirable effort is the support of a school as at present organized and conducted, but considerably strengthened in staff, equipment and library. Some of the reasons why the state should support medical education are: (1) the need for physicians and the necessary replacement of practitioners in the state, and the importance of having these accessions or replacements made by men of satisfactory type; (2) the demand for medical instruction on the part of well-qualified students in this territory, the sons and daughters of taxpayers; (3) the need for the state to conserve for its own use a reasonable proportion of the future leadership of its youth. In the same way the school if it is to continue must limit its enrollment even more rigidly than it has in the past, applying a higher quality requirement. Any effort beyond good provision for a somewhat smaller number of more promising students should be directed toward research, and toward assistance in graduate work for practitioners. Reasons for such a policy if not obvious may be enumerated as follows: (1) the limit to the demand for physicians and their replacement; (2) the limit to the number of really well-qualified and promising youth interested in this field (the fact noted in a paragraph above that about one out of five or six who have begun medicine in the school has failed to complete the two-year curriculum would speak for a higher quality requirement for entrance; though changes in plans and failure in health account for part of the shrinkage); (3) the limit to the number of transfer students that can be provided for in clinical schools (the present indications are that the students ranking low in the class will find more and more difficulty in transferring); (4) the cost or expense of this as well as of all other forms of higher education, indicating that admission should be limited not only to applicants from the state, but to students whose records mark them as of high quality and good promise; it would be desirable, however, if the school were able to accept a few applicants from western states in which there are no provisions for medical education.

An extensive survey of medical education in the United States has been going on for about two years. For a time there seemed to be a question as to the desirability of the two-year or incomplete schools as such, but this question has been waived. An inspection of the School of Medicine of the University of North Dakota was made in April, 1936, by representatives of the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. No report of the inspection has yet been received. In the absence of the report, however, it would be fair to say that the strong points of the school are:

1. A good but small faculty.
2. A good student body, desirable as to type and quality.
3. Abundance of dissecting material and laboratory animals.
4. Good work on the part of both faculty and students.
5. Good results as shown by the success of its graduates.
6. The need for the school in this territory.

The weaknesses grow out of limitations in financial support almost entirely:

1. The faculty is too small.
2. Salaries are impossibly low from the point of view of retaining good men permanently, or of replacing men in the case of loss.
3. Library and department budgets for supplies and equipment are manifestly too low.

The figure is not too strong to compare the school in its conditions of the last few years to a car that has some perfectly good parts and that has fortunately been able to give good service, but that has poor tires and no spare. The state must realize the importance of its service and be willing and able to support the effort considerably better, or the school will certainly lose its rating and soon become a thing of the past.

A statement regarding the school was mailed last winter to some of the doctors of the state and to a few others. In particular was it sent to the 65 or more former students of the school practicing in the state and to perhaps as many other representative graduates; to these groups the statement was accompanied by a letter asking for very frank criticism. There were many oral replies, and 75 or more letters were received from former students. The letters varied greatly in length and in the detail in which the analyses were worked out. Many spoke of the financial need, some offered certain criticisms and suggestions that are in general well taken. All of the writers maintained that they had found themselves not at all handicapped as they continued their studies and work in clinical schools, hospitals, and practice. Every letter is a strong argument that the school should be both adequately supported by the state, and continued with full recognition by the rating bodies. It would seem that a better jury or board of judges could not be found than the correspondents collectively.

It is difficult to select either letters or parts of letters for quotation. One of the longer analyses and a few brief quotations must suffice:

A.—A. S.—Finishing at Harvard, an honor student here and there, Licentiate of the National Board, Instructor in Internal Medicine at Michigan.

1. "The North Dakota Medical School has adequate proof, in the records of its graduates, that their basic education has been thorough and complete, equivalent to that provided by other schools, and enabling those graduates to compete successfully, upon transfer, with their classmates elsewhere. You have ample proof of this fact in your records; it need not be argued about.
2. As one of those graduates, who later transferred to Harvard Medical School, I found no significant handicap in adjusting myself to the group which had been trained by all the facilities of that great institution. For the fact that I was able to graduate there in the honor group of the class, and to take the National Board examinations with a fair degree of success, I am indebted as much to instruction received in North Dakota as to that received in Boston.
3. The type of instruction received at North Dakota has several distinct advantages over that provided in larger schools. For personal supervision by a competent teacher there can

be no substitute. I prefer it to any other method of education. After having had experience as a student in the medical schools of Michigan and Harvard, I can say that I believe it easier for a student to acquire knowledge from the faculty of the North Dakota Medical School. The familiarity of the instructor with the student, and *vice versa,* makes the difference.

4. Many young men, including myself, have found it possible to enter the medical profession solely because of the existence of these local medical schools. To leave the state of residence, and pay the high fees uniformly charged by the "complete" schools, would prove an insurmountable barrier. I believe that there should be some better criterion of reducing the number of medical matriculants than financial handicaps.
5. The concentration of medical schools in large cities may tend to produce a 'one-sided' group of medical graduates. There is actual need for medical schools in the less densely populated regions, such as North Dakota. There, the medical school provides scientific and salutary medical influence for the entire state, and makes possible medical education for the type of person who is best fitted to serve the medical needs of the state.
6. The value of an organization or institution cannot be measured by its physical properties, facilities, resources, or the number of its personnel. The true criterion of value is the result of its efforts. For a properly selected group of students, the facilities at North Dakota were adequate, during the time when I was a student there. The student, himself, represents an important factor in the success of education. Those persons fitted for the study of Medicine need fear no handicap from receiving their basic instruction at North Dakota.
7. I feel that I have lost nothing from receiving my first two years of medical training at the University of North Dakota. Knowing what I do, I would choose the same course, if I had to repeat my educational process. I would not hesitate to advise a friend or son to do the same, provided I were sure that he would be assured of the type of training which I received."

B.—C. H.—Finishing at Harvard, an honor student, with the Institute of Cancer Research, Columbia University.

"My last two years of medical schooling were obtained at Harvard Medical School, where I was accepted without any conditions and with full credit in the third year class. Although I found my classmates somewhat older than I, I had no difficulty in keeping pace with them. I found myself well prepared in the fundamentals of anatomy, physiology, and pathology. As I look back I cannot recall any handicap due to having had my first two years of medicine at the University of North Dakota. Indeed, I believe that I can truly say that I had several advantages over some of my classmates at Harvard. I had received more personal instruction, and I had spent a greater share of my time on the fundamentals that matter most, i. e., anatomy, physiology, and pathology. I graduated in the upper third of my class in 1923. . . .

If the gentlemen who decide the destinies of medical schools for the A. M. A. could realize that institutions are not built of bricks but of the men who run them, I am sure that there would be no question but that your medical school would continue."

C.—P. W.—Finishing at Vanderbilt, an honor student, going into Pathology.

"My own clinical years and my hospital training since graduation have not changed my opinion that my first two years at North Dakota were equal to any instruction that I could have obtained in any medical school. . . .
In some subjects, notably in neurology, my own information was ahead of that of my classmates in my last two years."

D.—C. G.—Finishing at Rush, F.A.C.S., practicing in North Dakota.

"Our entire class, seven in number, entered Rush and at no time did we feel that we were not as well prepared in the pre-clinical work as students coming from the larger schools. . . .
In the Cook County Hospital examination in 1915, three members of our class of seven placed in the first twenty (60 places being open and nearly 500 writing)."

E.—L. R.—Finishing at Rush, an honor student, F.A.C.S., Licentiate of the National Board, Urology, Northwestern University Medical School.

"Regarding the two-year course offered at North Dakota, my impression has always been, that the majority of students are better prepared to step into the clinical years than the average student from large four-year institutions. This may be due to the closer supervision and instruction which, of course, is possible in a smaller school. . . .
From my own experience, I have felt equally prepared with other classmates who come from the University of Chicago or elsewhere."

F.—N. F.—Finishing at Northwestern, Licentiate of the National Board, practicing in North Dakota.

"If there were not a medical school in North Dakota there would be but very few young men of our state who could afford the added expense of medical education at distant medical centers; and, disregarding the expense factor, but a small fraction of the number now studying medicine at North Dakota each year would be able to gain admittance as non-resident students in foreign states....

As to the qualifications of the student transferring from North Dakota to larger schools, I know that they are equally well prepared. I am sure that they do not start the junior year under any handicap because of transfer. The need of clinical material for the instruction of first and second year students is minimal."

G.—R. K.—One year at Northwestern, finishing at Buffalo, an honor student, instructor, etc., at North Dakota, Buffalo, Minnesota, going into Pathology.

"To me, the small classes, such as we had at North Dakota, are incomparably superior to the large groups I encountered later, both as a student and as a teacher. The methods of teaching, the results obtained and the spirit of the student are far better in the smaller group. In our own freshman year, we acquired a personal attitude toward medicine. We learned to regard our work then as a professional duty rather than an academic one. Somehow, I feel that a great many of our seniors here do not yet have that attitude."

H.—E. R.—Finishing at Rush, Licentiate of the National Board.

"I feel that it would be nothing short of a tragedy to close the medical school at Grand Forks. Most of your students could not afford to undertake the study of medicine if it were not for the low cost of attending the University of North Dakota. . . . Closing the two-year schools will only make it impossible for young men and women remote from the great centers of population to secure a medical education. North Dakota and similar states are in need of physicians and I have no doubt that a large percentage of your students settle in North Dakota....

I feel that my own preparation for entrance to the Junior year at Rush Medical College was in every way equal to that possessed by my classmates who secured their pre-clinical training at the University of Chicago."

I.—J. W.—Finishing at Northwestern, an honor student.

"In coming from North Dakota to Northwestern I found myself equally if not better prepared than those who entered the third year from Northwestern itself. Despite the advantages of courses under eminent professors in wonderfully equipped laboratories, I am certain that my knowledge of the basic sciences was better than the average Northwestern man. Certainly I had no difficulty with anatomy, physiology, and pathology....

It is my opinion that the two-year school is of definite value. As for myself, I probably would not be in medicine today, had it not been possible for me to have had my education partly in a smaller school. . . . The profession is probably more crowded with weak graduates of first and second rate complete schools than with men who started in the two-year schools. The latter usually weed them out before it is too late."

J.—C. T.—Finishing at Rush, F.A.C.S., in practice in North Dakota.

"It is my firm conviction that there is a real need for the School of Medicine at the University of North Dakota, and that this School has turned out, and is turning out students at least equal to the average student of the four-year schools."

K.—L.M.—Finishing at Nebraska, in rural practice in North Dakota.

"I shall always feel that having a good Medical School in North Dakota is entirely responsible for my entry into medicine, because, as you know, I could not have thought of going anywhere else. The only money I had was a few dollars I could make during the summer months. In my case at least, the School meant the difference between entering the field that I know I can be at least moderately successful in, or going into some work or profession in which I had little interest, and in which I should probably have felt that I was a misfit....

North Dakota, and more especially the section of the state in which I practice, is in crying need of well-trained physicians. Our county which is one of the largest in the state, in point of territory if not of population, has now only two active practitioners. The rural sections of the state could not hope to have acceptable practitioners, except in a few cases, were it not for the fact that the Medical School at the University has enabled men from the backwoods districts to secure a medical education. Most of these are satisfied, for a time at least, to practice in small towns."

L.—M. F.—Finishing at Indiana, in rural practice in Minnesota.

"The work I received at North Dakota was thorough and complete in every detail. In no way have I found myself handicapped through the fact that I attended a two-year school. Personally, I believe that I gained by so doing, not only financially, but through the close personal supervision and instruction that is possible only in a small group."

This statement makes use of data with which the writer is familiar. With the change of only names and figures it would no doubt apply to medical education in South Dakota as well.

The Problem of Cold Prevention*

Yale Kneeland, Jr., M.D.
New York

WHEREVER people are massed together in the temperate regions of the earth, colds are by all means the most common of infectious diseases. An acute head cold by itself is a minor affliction, causing the sufferer a certain amount of annoyance and discomfort, but passing away without untoward after effects. The amount of invalidism that it causes is relatively slight—a day or two at the most, with diminished efficiency of a little longer duration. The uncomplicated head cold, therefore, is not a health problem of the first magnitude. But complications exist, and they exist with tremendous frequency. These complications may be roughly classified in four groups: first are the local extensions of the disease giving rise to acute or chronic inflammation of the para-nasal sinuses, the middle ear, the mastoid cells, etc.; then we have the acute and chronic infections of the deeper respiratory tract, the way for which is paved by the common cold; thirdly are the more remote disorders which colds may activate, such as rheumatic fever, heart or kidney disease; and, lastly, are the group of serious infections of the type designated as "grippe" or "influenza," which are now coming to be realized as close relatives of the common cold. Viewed in this light, colds do indeed take on a role of the first magnitude, causing in the aggregate an immense amount of time lost, of suffering, and even indirectly of death.

That colds are infectious, that they come from without and not from within, has been abundantly demonstrated within recent years. The study made by Paul and Freese[1] in Spitzbergen perhaps best establishes this fact. Briefly, the population of Spitzbergen, about 500 in number, went through an entire winter of bitter cold and exposure under close observation without colds. During this period, with the harbor ice-bound, they were wholly isolated from the rest of the world. However, within a week of the arrival of the first boat in the spring, 125 of these people were stricken with the common cold, and respiratory disease of various types was rife throughout the summer. During the whole period of observation, pathogenic bacteria could be cultivated from the throats of these individuals; no significant change in this bacterial flora could be detected after colds ceased in the autumn or after they began in the spring.

The implications of this study are enormously important; it demonstrates that intemperate weather, body chilling, or pathogenic bacteria of the upper respiratory tract, are of themselves powerless to initiate the phenomena of respiratory disease. And it implies that there exists some essential *factor* to ignite the fuse—a factor which is highly communicable, and which confers at least a transient immunity, so that in a population as small as 500 it can run itself out for want of fresh material.

That this "factor" is a filtrable virus has by now become well established.[2] We have then some understanding of the etiological complex underlying upper respiratory disease. We have first a virus of tremendously high communicability; next we have various pathogenic bacteria which seem to be capable of becoming invasive when activated by the virus; then we have conditions of climate, weather, and sunlight which certainly appear to govern the severity of colds in the mass; and, lastly, we have the resistance of the individual, which may be altered by exposure, by habits of life, by diet, or numerous other factors. Having thus defined the problem in terms of its components, we can go on to the practical question of what to do about it.

In a very brief way we can first dismiss the ordinary public health measures which are used with success in other infections. Inasmuch as the virus of the common cold is ubiquitous in civilized communities and can probably be carried by individuals in a state of apparent good health,[1] quarantine proceedures are manifestly of very limited usefulness. Furthermore, as it is passed directly, there is no way in which its line of communication can be interrupted such as exists in diseases like typhoid fever or malaria. Lastly, there is no means of rendering the population, or its essential majority, immune to the virus itself as can be done in the case of smallpox. Having thus discarded the public health methods that are applicable to masses of people, one comes down to what might be described as individual preventive medicine. What can the individual himself do, or have done to him, which will render his own cold problem less severe? As long as human beings insist on living together in large aggregations in these latitudes, this question will present itself. We cannot alter the weather or the climate or the urban habit of mankind.

It is safe to begin by saying that the measures to be discussed apply to the really susceptible individual. It is obvious that a person who suffers an uncomplicated cold only at long intervals of time has no need to bother with them. To the very susceptible person, on the other hand, an evaluation of these methods is of great moment.

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*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, Dec. 28, 1935.

The most obvious thing that comes to mind in this connection is the constitution of the upper respiratory tract itself—that is to say, the presence or absence of such abnormalities as deviation of the nasal septum, hypertrophied tonsils, etc. It would seem natural that surgical correction of such would be the first essential measure in cold prevention. Paradoxically, however, this cannot be shown to be the case, for in the careful study made by the Johns Hopkins group[3] these abnormalities did not seem to be related to cold susceptibility. One of these same investigators[4] has also shown that all the "hardening proceedures"—i. e., those various factors such as exercise and clothing which we ordinarily associate with hygienic living—are without influence on cold susceptibility. We cannot, therefore, hope to make much headway with the cold problem by doing submucous resections or advising the proper amount of fresh air and exercise.

Another field that has been explored with great hopefulness is the vitamins, particularly vitamin "A." Very small amounts of this vitamin will cure the chronic respiratory disease of rats on an A-deficient diet. However, the use of it in excess cannot be shown to affect the cold susceptibility of either infants or adults.[5] These studies have been so well-controlled as to leave little doubt in anyone's mind about the inefficacy of either vitamin A or D in this regard. Reference to vitamin D brings up quite naturally the subject of ultraviolet irradiation. The Alpine lamp has been extensively used to enhance individual resistance to colds—and rightly so, for it would seem to supply the sunlight which is so conspicuously lacking in our northern winters. Some investigators have obtained favorable results with this treatment. On the other hand, well-controlled studies of its effect in both infants and adults[6] fail to corroborate this. I think it is fair to conclude that the routine exposure of cold-susceptibles to the Alpine light is not conspicuously successful in reducing the incidence or the severity of colds.

Finally we come to the subject of "cold vaccines"—that is, stock mixtures of killed bacteria of the upper respiratory tract. Here, again, there is much evidence that their use on a large scale affords little if any protection against colds. However, if the complications of colds are caused by bacterial infection, one might reasonably hope to reduce them by vaccination with these bacteria. Our own experience with such vaccines[7] leads us to believe that this is the case. They do not seem to reduce the incidence of colds, but if they are given in sufficient dosage over a long enough period of time they seem to modify their severity. The use of mixed vaccines, therefore, is not to be recommended except for those individuals who are extremely susceptible to the common cold and its complications. Then, when used, these vaccines should be given in adequate amounts, and injections kept up at weekly intervals throughout a good part of the winter.

It is obvious from the foregoing paragraphs that the problem of cold prevention is an unsolved one. We have discussed many measures which we know are not effective, and one measure which is partially effective in a selected group of cases. We are forced to admit, therefore, that preventive medicine has little to offer the cold sufferer, and gives place in importance to therapeutics, which lie outside the scope of this paper. Lastly, there is reason to believe that not until an immunity to the cold virus itself can be generated will the problem be solved.

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Studies of the Treatment of Colds*

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AS A SUPPLEMENT to rather than a discussion of Dr. Kneeland's paper, I have been requested to present a brief summary of some of our studies concerning the treatment of the common cold. These studies have extended over a period of more than three years and have covered the treatment of between 7,000 and 8,000 individuals.

The first requirement set up for these studies was that the results should be carefully controlled. This was accomplished by including sugar tablets among the preparations to be studied and by dispensing the medications in such a

*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, December 28, 1935.

manner that neither the physicians, the patients, nor the individuals who passed upon the results had information as to what medication had been used.

During the course of these studies[1] practically every drug combination which there was any reason to think might be of value in the treatment of colds was tried. The results obtained in patients with acute coryza are summarized in the following table.

TABLE I

RESULTS OF TREATMENT OF PATIENTS WITH ACUTE CORYZA

Medications	Cases	Percentage Reporting: Definite Improvement	Unpleasant Symptoms
Codeine-papaverine	3765	70.6 ± 0.3	4.7
Codeine-papaverine with ephedrine inhalant	163	74.2 ± 2.3	3.6
Codeine-papaverine with ephedrine and merthiolate	130	76.0 ± 2.5	5.2
Dilaudid-papaverine	181	74.0 ± 2.2	7.1
Morphine sulphate	162	72.7 ± 2.4	9.4
Dilaudid	86	67.4 ± 3.4	18.3
Codeine sulphate (½ gr.)	72	54.1 ± 4.0	25.4
Codeine sulphate (¼ gr.)	87	47.1 ± 3.6	15.1
Papaverine hydrochloride (½ gr.)	98	51.0 ± 3.4	3.7
Opium powder	28	57.6 ± 6.7	9.3
Powder opium and ipecac	61	55.1 ± 4.3	5.1
Quinine Sulphate	64	50.0 ± 4.2	9.5
Acetylsalicylic acid	79	48.1 ± 3.8	3.3
Acetylsalicylic acid—acetphenetidin—caffeine	86	44.6 ± 3.6	2.1
Atrophine sulphate	50	40.0 ± 4.7	6.9
Calcium-iodine	52	44.2 ± 4.7	8.2
Halibut liver oil	52	46.2 ± 4.7	8.2
Ephedrine sulphate by mouth	50	42.0 ± 4.7	7.8
Ephedrine sulphate, 1%, dropped in nose	51	31.3 ± 4.4	4.3
Ephedrine sulphate, 1%, in 1:5000 merthiolate dropped in nose	71	47.8 ± 4.0	2.8
Merthiolate 1:1000 solution, ½ dropper full in nose every 3 hours	56	46.4 ± 4.5	8.6
Nationally advertised internal medication	72	44.4 ± 3.9	12.9
Nationally advertised nose drops	36	30.6 ± 5.1	3.6
Lactose (control)	110	35.5 ± 3.0	1.7

The importance of including a control group in such a study is shown by the fact that 35 per cent of the students who received the sugar tablets, thinking they were an effective medication, reported definite improvement or complete relief in 24 to 48 hours after taking the medication.

Opium Derivatives in Colds

The medications of greatest value, according to this study, were all derivatives of opium. This is particularly interesting in view of statements by De Quincey and other writers on opium to the effect that addicts, while using opium, are free from colds. It also explains why the use of Dovers powders has continued for more than 200 years. This mixture of opium and ipecac, which originally contained also potassium chlorate, was suggested by Thomas Dover in the latter part of the seventeenth century for the treatment of gout. Later it was advocated as a sweating powder in the treatment of colds, for which purpose its use has been continued. Our results indicate that this preparation has merit in the treatment of acute coryza, but that the opium alone is just as effective without the ipecac.

Some of the opium derivatives, although effective for the treatment of colds, are clearly undesirable for general use either because of the danger of habituation or because of the considerable number of persons who experience unpleasant symptoms following their use. In these studies several opium derivatives which carry no practical danger of habituation were tried in different combinations, proportions, and dosages. Finally a preparation consisting of equal parts of codeine and papaverine was selected as most useful for this purpose. Of 3,700 students who were given this preparation for the treatment of acute head colds approximately 70 per cent reported definite improvement or complete relief within 24 to 48 hours.

Certain of the studies concerning the codeine-papaverine combination indicate that: (1) the proportions of choice are ¼ grain of codeine and ¼ grain of papaverine; (2) this mixture of codeine and papaverine gives a significantly higher percentage of good results and produces less headache, dizziness, nausea and vomiting than a corresponding quantity of codeine alone or papaverine alone; in other words, codeine and papaverine in this dosage apparently act synergistically; (3) the optimum dosage of this mixture for an adult of average size is one tablet after each meal and two at bedtime; if the cold is well established this dosage should be continued for two or three days; (4) the effect observed on persons who report improvement is a prompt decrease or complete disappearance of nasal discharge and congestion; (5) the earlier the treatment is instituted the higher the percentage of good results reported—in fact, if this preparation is utilized at the very onset of symptoms a few tablets are usually sufficient to prevent further progress of the cold; if delayed the proportion of beneficial results declines from 73.3 per cent for the first day to 60.4 per cent for the fourth day; (6) students who used this preparation for the treatment of coryza lost significantly less time than did those who used other medications.

The use of ephedrine with merthiolate or "ephedrine inhalant" locally in the nose together with the codeine-papaverine by mouth resulted in a slightly, though hardly significantly higher proportion of favorable reports.

The mechanism through which opium and its various derivatives act to check coryza is not entirely clear. They are not, of course, viricidal. Certain observations suggest that its action may be primarily through the vaso-motor system. The effect is to diminish the physiological disturbance produced by the cold and thereby reduce the discomfort which is produced and the frequency of secondary infections which, as Dr. Kneeland has stated, so commonly follow the relatively unimportant primary disturbance.

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[1] *Medicinal Treatment of the Common Cold*, Journal of the American Medical Association, Vol. 101, No. 26, pp. 2042-2049, December 23, 1933. *Treatment of the Common Cold*, Journal of Industrial Hygiene, Vol. 17, No. 2, pp. 48-65, March, 1935.

The results obtained with certain other drugs utilized in the treatment of colds include the following:

Quinine sulphate was followed by a significantly higher proportion of good results than were reported for the control tablets, but was less effective than most of the opium derivatives. The proportion of unpleasant symptoms reported following the use of quinine was approximately 10 per cent.

Atropine sulphate, which is the active principle in most coryza or rhinitis tablets, produced a temporary dryness of the nose and mouth in many cases, but seemed to have no apparent effect upon the course of the cold.

Acetylsalicylic acid; a combination of acetylsalicylic acid-acetphenetidin-caffeine; ephedrine sulphate; halibut liver oil; sodium bicarbonate; and a calcium-iodine preparation resulted in slightly but hardly significantly better results than the control tablet.

Ephedrine sulphate, one per cent, used locally in the nose, gave temporary relief of nasal congestion but seemed to have no effect upon the progress of the cold. The same strength of ephedrine sulphate in 1:5000 merthiolate solution was followed by a somewhat higher proportion of good results but was less effective than the opium derivatives. A larger quantity of 1:1000 merthiolate solution dropped locally in the nose was tried because of a communication from a physician to the effect that he found this medication uniformly beneficial in the early treatment of coryza. In our controlled study, however, the results with this preparation were disappointing.

Commercially advertised medications. A preparation which is nationally advertised and extensively used for the "internal treatment" of colds gave about the same proportion of good results as did soda and acetylsalicylic acid, and a nationally advertised medicated oil to drop into the nose, although used by millions of people, gave no better results in this controlled study than did the sugar tablets.

In the subacute and chronic colds the codeine-papaverine combination usually relieved nasal congestion and seemed to be of benefit to approximately half of the patients. The difference, however, between these results and those reported for other medications is hardly great enough to be of significance.

Forced Fluids in Colds

The forcing of fluids in colds has long been considered a valuable aid in the treatment of colds. The basis for this has been an assumption that, with the greater elimination of fluids, the toxic products produced by the infection would be reduced. Apparently, however, there have been no scientific studies to show the value of this procedure; hence we must conclude that the practice is entirely empirical. In fact, there is even some suggestive evidence that in pneumonia the forcing of fluids may do more harm than good.

During the past year some of our studies have been concerned with the effects of various quantities of fluids in the treatment of colds. All of the patients in this study received tablets of codeine and papaverine in usual dosage but in addition one-third of the group was advised to drink twelve or more glasses of fluid per day; another third less than six glasses; while the rest were told to drink between six and ten glasses. Patients were also instructed to keep a careful record of the amount of fluid taken each day during the period of treatment and to report this with the results of treatment. The final grouping of cases was then made on the basis of the reports as to the amount of fluids actually taken rather than the amounts advised. The results of this particular study reported to date cover 1,547 individuals with acute coryza: 482 took less than six glasses of fluid per day, of whom 62 per cent reported beneficial results; 725 took six to ten glasses, of whom 71 per cent reported definite improvement; and 340 took 11 or more glasses, of whom 66 per cent reported improvement. These results, while not conclusive, suggest that persons with acute colds get along at least as well when they let thirst determine their fluid intake as when they attempt to force or restrict fluids.

Summary

1. Controlled studies of the various drugs used in the treatment of colds indicate that the highest percentage of good results with least unpleasant symptoms follows the use of a combination of codeine and papaverine.**

2. The use of this preparation, as well as the use of certain other opium derivatives, is followed by prompt diminution or complete relief of nasal congestion and discharge. This relief of symptoms not only makes the patient more comfortable but also seems to decrease the probability of secondary infection.

3. Of the other medications studied certain ones seem to have some merit but none was nearly so effective as the opium derivatives.

4. A preliminary report of a study on the value of fluids in the treatment of the common cold suggests that patients get along at least as well when they let thirst determine the fluid intake as when they attempt to force or to restrict fluids.

**The exact preparation used in these studies was Copavin, tablets or pulvules, prepared by Eli Lilly Company of Indianapolis, Indiana.

Anesthesia With Highly Volatilized Ether Vapor*

Garnet King, M.D.
Los Angeles, Calif.

SINCE there have been a large number of units, bearing my name, sold to medical men in southern California, I have been requested to give this short paper at this meeting, with the idea in mind that it would be helpful to a better understanding of the operation of the equipment and the principles involved.

It has been claimed, by probably the majority of authorities on anesthetics, that ether is outstandingly the safest anesthetic, this being true, particularly, in the hands of a physician who is not necessarily a skilled specialist in anesthetics. Since the advent of ether, as an anesthetic agent, many different means have been used in an effort to simplify its administration, and to eliminate unpleasant and undesirable post-operative effects.

Hot towels on the face mask, blowing the breath on the mask to warm the vapors, the placing of a heat lamp directly over the mask, have been used for many years, by anesthetists, in an effort to volatilize the ether. Some masks have been designed with a separate compartment, permitting re-breathing, and to otherwise assist in volatilizing the ether with the patient's breath.

A bottle, containing hot water, with a tube running through the neck, heating the ether in its passage through the tube to the face mask, has been, more or less, commonly used.

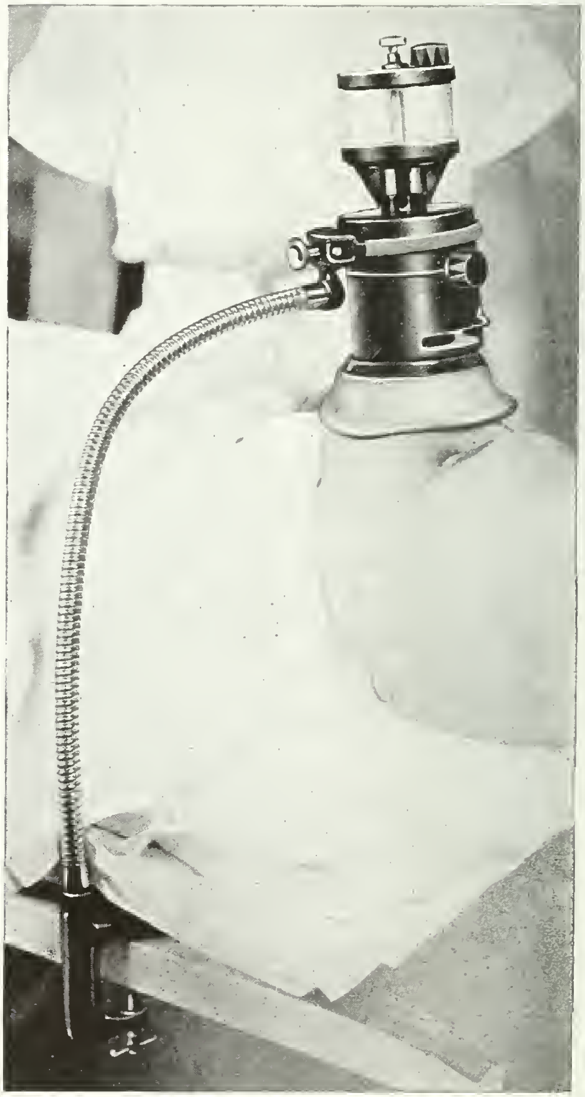
Quite a number of devices have been created for warming the ether by electrical means, but in addition to the expense involved in such an apparatus, it is contrary to the law in a number of states, to use such an electrical device in surgery, because of the fire hazard. Obviously, all these efforts are in recognition of the advantages of highly heated and volatilized ether.

Numerous articles have appeared in various medical journals on the advantages of volatilized ether. I desire to quote briefly the following articles:

The A. M. A. Journal, Vol. 104, No. 26, date June 29, 1935, page 2,315, by Dr. John S. Lundy, Rochester, Minn.—"The anesthetist, whatever he sees demonstrated, whatever he knows, and whether he is experienced or inexperienced should never forget that, of two anesthetic agents of similar toxicity, *the more volatile one is the safer.*"

The California & Western Medicine Journal, Vol. 43, No. 4, date October, 1935, by Dr. Mary E. Botsford, San Francisco, Calif.—"Because of the small tidal volume of a baby's respiration, the open drop method is unsatisfactory; also the temperature of the aspirated air is lowered when the ether is vaporized on a mask." Deforest Willard says: "When it is recalled that the surface of the air vesicles is far greater than that of the body's surface the *chilling effect of ether* can be well recognized."

The A. M. A. Journal, date October 7, 1933, page 1,197, this report being largely a summary of the original article as it appeared in one of the German medical journals: Dr. M. Tiegel



The above illustrates the King Thermanester, together with the holding arm, as it is used in anesthetics for major surgery.

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*Presented before the Anesthesia Section of the Los Angeles County Medical Association, August 18, 1936.

reported as follows, under the subject "*Anesthesia with Highly Volatilized Ether Vapor.*"

Dr. Tiegel submits his clinical observations with a new method of ether anesthesia. The ether is highly volatilized by being warmed considerably above its boiling point. Anesthesia induced by this method seems to possess characteristics almost entirely different from those of the old drop method of administration of ether. The two interesting features of the new method are that analgesia sets in earlier than the loss of consciousness, and continues for some time after consciousness is re-gained, and the blood of the patient is highly aerated, as evidenced by a rosy color of the face all through the anesthesia, and for a few days after. This highly volatilized ether vapor appears to be non-irritating to the bronchial mucosa, making its administration possible in instances of bronchitis, colds and coryza. It has a stimulating effect on the circulation. Determinations of the blood pressure during anesthesia oscillated within 5 to 10 millimeters. The author summarizes the advantages of the method as follows:

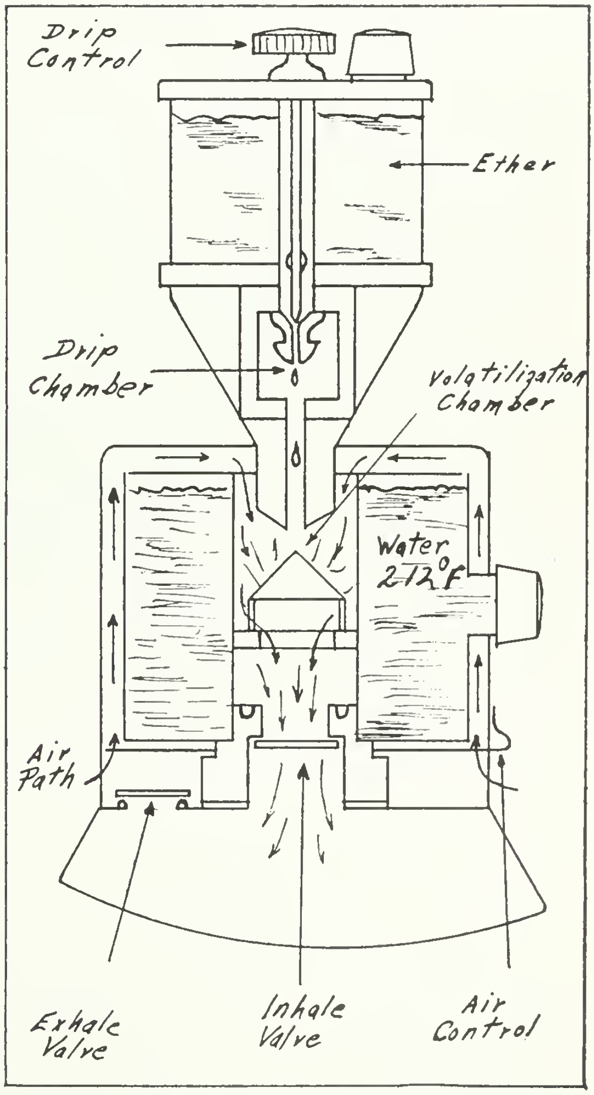
"It is safer than the old method, which, in itself, was considered quite safe for decades; premedication or combination with other anesthetic agents appear unnecessary. The induction of sleep is pleasant, and is not accompanied by excitation, the degree of anesthesia is readily controlled, a stimulating effect on respiration and circulation is evident. The indication for its use is not limited by age or organic disease; the return of consciousness is rapid; there is an absence of unpleasant post-narcotic phenomena such as nausea, vomiting, headache and a disturbance of the intestinal functions; the amount of ether required is less than with the old drop method."

Having observed, during the past several years, so many attempts by anesthetists to volatilize the ether, the thought occurred to me that a simple device might be created, which would provide the heat and volatilize the ether directly at the patient's nose and mouth, reducing any chances of the ether cooling again before it reached the patient. The next thought was, the simple means of using boiling water within a container similar to a thermos bottle, and surrounding a vaporizing chamber. This, in a very crude way, I developed, then later added the means of the continuous and steady drip of ether with an automatic valve arrangement responding to the exhalation and inhalation of the patient, together with a means of regulating the air volume.

After several years of experimental work mechanically, what is now known as the *Thermanester* was developed.

In proving this unit clinically, I was graciously given the co-operation of several anesthetists and surgeons in Los Angeles, by being permitted to use this device on a number of their cases. During the development stage, over 200 anesthetics were given and improvements made mechanically. On a few cases, premedication of M. S. & Atropine were used. In most cases, there was no premedication. Many of the cases were emergencies, and no opportunity permitted doing anything in the way of the usual dietary or other preparations.

In 178 cases, there was not a single post-operative nausea or vomiting; in 22 cases, there was some very slight nausea, with vomiting in only three cases; there was gaseous abdominal distention in only five cases, this, accompanied with a slight nausea, but in all five, there was considerable intestinal surgical manipulation. In not a single case of the entire series did even a mild pneumonia follow, although, in a few cases patients were anesthetized for prolonged operations



The above illustrates the construction of the Thermanester. For the sake of clarity of drawing, copper wool filters used in the volatilizing chamber and springs which automatically activate the breathing valves and the cork insulator around the water tank are not indicated.

while suffering from an acute chest, throat or nasal inflammatory condition; in fact, the inhalation of volatilized ether in these cases seemed actually to improve their condition. In only one case did we observe a blood pressure increase of more then ten points. In all cases, the return to consciousness occurred within 10 to 15 minutes, and in most cases, patients would have actually been ready to eat, had they been permitted to do so. On the average, we estimated that from one-third to one-half of the usual quantity of ether, used by the open drop method, was saved.

At this time, I wish publicly to extend thanks to the following doctors, who so generously permitted me to anesthetize a number of their patients, and were very helpful in their continued advices: C. A. Bachhuber, M.D.; Albert C. Germann, M.D.; Robt. J. James, M.D.; Alexander C. Cameron, M.D.; Ida Heissig, M.D.; Wilma Cameron, M.D.; E. F. Maginn, M.D.; W. Arden Fate, M.D.; C. G. Sutherlin, M.D.; Edwin Larson, M.D.

After approximately one dozen completely changed working models, the finished Thermanester is as you see it here. It consists of a glass and bakelite ether container compartment, which holds a quarter pound of ether. The flow of ether is controlled by the use of a needle valve, adjustable on the head of the instrument, and the amount of drip may be readily observed in the small glass compartment below the ether container. The body of the instrument is made of molded bakelite, of a special kind which will not contaminate the ether.

Within the body of the instrument is a cylindrical doughnut shaped copper tank. Boiling water is placed in this tank. Within the hole of the doughnut shaped tank is placed a baffle plate upon which the ether drops. Since the baffle plate is directly connected to the sides of the water tank, it becomes very hot, and this temperature is retained adequately high to completely volatilize the ether, even through a one hour and a half operation. On the side of the body of the instrument is a valve which regulates the amount of air permitted to mix with the volatilized ether; its path is upward, along the outside of the hot water tank, between the sides of the water tank and the bakelite jacket, then over the tank and down through the volatilizing chamber.

Immediately below the volatilizing chamber, built into the bakelite mask, there is an automatic inhalation valve which readily and quickly opens upon the patient's breathing, and automatically closes upon the patient's exhalation, at which time another valve opens, permitting the exhaled breath to escape entirely from the instrument. Incidentally, since this is an entirely closed method, and the exhaled fumes from the patient are non-explosive, the fire hazard is reduced to practically nil.

In administration, the Thermanester is simple in use. Although many cases were anesthetized without premedication, I believe that the usual dietary control and premedication is advisable, as with any anesthetic.

In use, the Thermanester should be filled with boiling water, and the container filled with ether. The unit is then placed on the patient's face, the operator observing carefully that the face cushion fits the contours of the patient's face snugly. Cotton or gauze should be used for filling in, in any cases, in which the face is of unusual contour, it being very important that the patient, upon inhalation, does not draw air from under the mask, instead of the volatilized ether gas from the machine.

To encourage confidence, the patient is permitted to breathe the heated air in the machine two or three times, then one drop of ether is permitted to flow into the machine, so that the patient may become familiar with the slight odor. Incidentally, due to the high volatilization, much of the odor of ether is eliminated.

The needle valve may now be adjusted to permit drops of approximately one per second, with the air control valve at the maximum position. After about three or four minutes on the average case, the ether may be increased to two to six drops per second, according to the patient's reaction. A few cases will not comfortably tolerate quite this rapid flow of ether, in which case, the drip may be slowed down, and the air volume reduced instead. After about 10 minutes the ether can usually be dropped at three to four drops per second, with the air valve at the minimum position.

Shortly, the completely relaxed surgical stage of anesthesia should be reached. Of course, it is assumed that the anesthetist is observing the usual land marks throughout the induction period. Once surgical anesthesia is induced, the drip valve can be adjusted to maintain approximately 60 to 70 drops per minute. This will usually maintain surgical anesthesia without further adjustment throughout the operation, aside from possibly a regulation of the air volume.

On the average case, the induction will be from 12 to 15 minutes; in a few cases, particularly alcoholics, the induction may run to 20 minutes or more.

Some users of the Thermanester, particularly in emergency work, have required a faster induction. To create the faster induction, with the use of ether alone would probably destroy the purposes for which the Thermanester is created. Hence, a number of physicians have used in conjunction with the Thermanester, for the early induction period only, a few drops of Ethyl Chloride.

This is accomplished by merely removing the head of the instrument from the body, and dropping into the vaporizing chamber from 10 to 20 drops of Ethyl Chloride, having the patient count aloud.

Usually, by the time the patient has counted 15 he is practically unconscious. The ether head may be placed on the instrument, and readily adjusted to two or three drops per second, and, in a matter of a very few minutes, the patient is thoroughly anesthetized.

Whereas, the Thermanester is made to be practically automatic, it requires the judgment of the physician, and he will find that after becoming thoroughly familiar with this method, it is simple and highly gratifying, because of patient's comfort. Due to the steady continuous drip of the ether, and the air control regulation, the stage of anesthesia is maintained at a level and even keel. In prolonged operations, although the water cools considerably, due to the cooling affect of the ether and air draft, it is still quite hot enough to volatilize the ether.

It is impossible for the patient to aspirate raw ether to the lungs during the induction stage, even at a very rapid rate of ether flow, providing the instrument has been properly filled with boiling water. When the machine is properly regulated, the patient's face retains a good color, free from any trace of cyanosis, as there is no appreciable air resistance on inspiration, the diameters through the machine being greater than that of the trachea. In operation, the ether drops can be observed at all times, even with the machine inclined at a right angle, as it may be placed for anesthesia during a mastoidectomy.

The Thermanester may be merely held on the patient's face for the shorter anesthetic. For a prolonged anesthetic, in which the anesthetist desires his hands to be free, there has been created this flexible holding arm for holding the instrument in place. A head band can be used in conjunction with the holding arm, if desired.

For your inspection, I will pass the unit into the audience, together with some of the parts which are used in its internal construction. You will note that the metal parts are either copper or have been chrome plated to avoid any ether contamination.

I wish to thank the Society of Anesthetists and the Los Angeles Medical Association for giving me this opportunity to present this paper, and trust that it will be helpful to those physicians who are using this device.

With your permission I will now demonstrate the use of the machine by carrying a patient through the induction stage. Perhaps a member of the audience may desire to volunteer as a subject.

"Dr. King, your paper and demonstration on this patient (The patient immediately after recovery from the anesthetic ate a Hershey chocolate bar.) is in keeping with my own experiences in employing your method with the Thermanester.

"In eight major surgical operations varying in length from 30 minutes to one and one-half hours, not a single patient experienced any post-operative discomfort for the anesthetic. One was slightly nauseated but this was due to excessive and very rich foods taken immediately before the operation.

"In all cases I used nothing but ether. The induction period varied from as low as seven minutes to twenty minutes, on the average about eleven or twelve minutes.

"To you I wish to extend my thanks as one physician, for your development of this method. Although it adds to my convenience in administering an anesthetic the greater appreciation is for complete patient comfort it makes possible in nearly all cases."

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Reflections on Sexology

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UPON the conduct and character of its sex life more than any other factor depends the quality, advancement and decline of a civilization. The Huns and the Vandals did not destroy Rome. It was the disintegrating effect of her complete moral abandonment and profligacy. The surfeit of material wealth with the inevitable softening effect of luxury on moral and physical stamina and ideals of life were, of course, the background for producing the moral breakdown. For "Where wealth accumulates men decay."

Many things in present day so-called Christian civilization, as touching various sides of life, most significantly in that of sex, are ground for most profound apprehension in the mind of every thinking man and student of human affairs.

Contrary to popular ideas there has been too much wealth too widely distributed in this country, especially since the beginning of the century, for the good of the people materially, morally and spiritually. It has been undermining and destroying individual ideals, character and performance. This means looseness in sex morals, destruction of the home, disintegration of society in the end.

It is the fashion at present to deride the puritanism of the founders of New England, those sturdy pilgrims whose "plain living and high thinking" stamped the fundamental principles of sound religion and high morals on this country's early development. Prompt return to those foundations will alone avert disaster. Whether there is sufficient moral stamina and character left to attain it is gravely uncertain.

The child of earlier generations was brought up under strong and sturdy control. He was required to obey and to do the things experience had taught his parents were best for the development of that child's character, morals and performance. Under such parental direction this country produced all its great men of the past. Toward the end of the nineteenth century the softening and deteriorating effects of abundantly and rapidly increasing wealth began to be generally manifest with relaxed home discipline, lowered moral standards and religious life.

At about the turn of the century there came to our shores a person with a mission, one Montessori, disciple of self-expression for the child. Her urge was that the child should never be required to obey, persuaded if possible, otherwise allowed to do as he pleased. The argument being that to require him to do anything against his wish was breaking his will. Complete confusion between will and willfulness. No recognition of the fact that the only way the individual learns self-control and self-mastery is through being required to exercise his will power to that end, never by being allowed to follow his own sweet will so called, really plain self-indulgence. Strength of character is never built by unrestrained following of inclination, but only by firm control during the formative years.

At about this same time, too, came the widely disseminated and published advice that parents should take their young children and instruct them in detail in the mystery of life and its reproduction. This cannot by any possibility be done by the parent from the position of orientation of the child, but from the point of knowledge and understanding of all his years of experience of life. This can only do harm and nothing else, often with moral disaster from the prurient curiosity sure to be aroused. Much more safe and normal for his understanding of this subject to come to him gradually from his broadening touch with life. Here the proper field of the parent is to teach solid principles of right and wrong, of self-control in all things, of high moral and religious concepts in general. If such precept and example are what they should be in the family life, there need rarely be any problem for the normal individual in the sex sphere, or danger to himself, society or posterity. For he would then mature with a sense of self-respect, respect and reverence for womanhood, modesty, chivalry, honor, restraint, sound religious faith, a standard of sexual continence and fidelity, against which there is no valid argument. And the euphonious terms "biological urge" and "gonadal cycle" do not abrogate the moral law or annul the commandments of the decalogue.

Of the baneful influences upon mankind, which assumed an important place in the course of civilization, the rise of feminism, which also came with the advent of the twentieth century, is one of the most important. The entry of women in vast numbers into the hurly-burly of everyday business life has been of unmeasured harm to the whole structure of society. Our attention at this time will be restricted to its effects direct and indirect in the sexual sphere alone. Woman's supreme function is and must forever be the bearing and rearing of the finest, highest type of human being that can be produced. No other career in all possible spheres of the world's life can approach this in influence, importance and results. For at its finest it fulfills that exalted sentiment, "A mother is a mother still, the holiest thing alive."

In the home, woman in the past was shielded from the contaminating influences inherent in the common life of the street, the shop and mart. She was revered and looked up to by man as of finer fibre, higher moral and ethical standards and religious ideals. All these qualities were surely conserved and preserved, and held against the downdrag of the dross of the outside world; such an anchor the home should be and was, but now is not. The change in the influence and regard for womanhood shows plainly in the everyday movement of humankind. No more do men lift the hat in token of respect, not now do men rise to give a seat in the tram to a lady. The men are now all seated comfortably reading the paper, the ladies swinging on the strap. Trivial incident? No, of profound import. For out in the world today woman is down to its level, blowing and snorting the smoke from her cigaret, resorting to all the shady things in business, standing at the same bar with the bleareyed bum, self-indulgent, sensual, taking part in the trickiest of politics which it was heralded she would lift to higher planes with the suffrage. She has sacrificed a great substance for an empty shadow, forgetting that eternally "The hand that rocks the cradle is the hand that rules the world," not the hand that wields the gavel or casts the ballot. Woman must return to her deserted throne, the home, to save it and the world from moral and spiritual disintegration.

Some are prone to defend or uphold the present unrestrained and indecent freedom of discussion of the question of contraception. It is presented without reserve in the public press, the subject of parlor conversation, the public address and formal consideration, if not endorsement, by various church bodies. It is a natural by-product of the entry of woman into the economic world. Its present prominence is largely due to the untiring voice of a female zealot. Its devastating effect on private and public morals is beyond estimate. It removes one of the strongest of inhibiting restraints on sexual lapse of conduct. It has been productive of untold moral misconduct in and out of wedlock, excessive attention to the sexual side of life, the ruin of many lives and the spread of venereal disease. It strikes at the very foundation of civilized society. The medical profession has long understood the limitations that should be placed and retained in the handling of this question, to strictly imperative requirements of health or life, not for convenience or unbridled indulgence. The argument that fewer children can be given more advantages and the family live on a better economic plane is false and dangerous. Larger families produce better men and women in character and achievement. General dissemination of knowledge on methods of control and access to devices should be prohibited, and the matter lodged exclusively in the hands of the medical profession in the interest of health, morals and society.

The influence of clothes on the affairs and destiny of the human race reaches beyond estimate in many directions, since the advent of man on earth, Shakespeare noted it when Polonius in advice to his son says:

> "Costly thy apparel as thy purse can buy,
> Yet not expressed in fancy, rich not gaudy,
> For the apparel oft proclaims the man."

and how much more the woman. One of her God-given attributes is to modestly, properly and decently attract the male. That is inherent in the plan of continuity of life. Within bounds it naturally has a place in enhancing physical charm. With the gradual advance of the savage to what we are pleased to call civilization man covered the body with increasing completeness, to the point where only the hands and head remained uncovered. For the most part this has continued the conventional dress of the world for past centuries. Ordinary variations in costume may not have materially important influence in any direction. Extreme alterations of custom and action may be of significant import both as to indicating and producing conditions and effects. That at present public and private sex morals, including the very young, are on a free and easy level, can hardly be denied. The earliest flagrant indication of the trend appeared in the strange and unaccountable increasing brevity in length and amount of women's clothing which began at the close of the world war. It went to the point of stark indecency, was arousing in its effect on the male, invited familiarity and had far-reaching effect in lowering standards of moral conduct. This manifestation of eroticism gradually subsided, apparently tending to return to something of modesty and reserve in clothing the body. Something, however, in the mass attitude is evidently still in rebellion against covering of the female figure, with a strong urge for more or less exposure of anatomy. So each summer season becomes the excuse for increasingly scanty bathing suits now at an irreducible minimum, and displayed not only at the beach, but on the street and in the automobile. And men's bathing attire is hardly less reprehensible. Going further than previously, this past season, children down to mere babies are allowed to go about in play, boys and girls together, with all but no clothing on their bodies. Any supposed benefit to health from direct sunlight on the body surface cannot warrant the peril to health in sex morals. There must be complete indifference to morals and ethics on the part of parents who dress their children thus. The public parade of mature females on bicycles dressed in shorts or less is a crude illustration of the tendency toward indecent exhibitionism only a slight step removed from the morally perverted and degenerate nudism that has for some time past been an increasingly ominous manifestation widely diffused throughout the civilized world. Its implications on the state of universal moral decadence are disquieting in the extreme. It is essentially a reversion to paganism and phallic worship.

While the sexual psychopath and pervert, the degenerate and mental defective constitute an important problem in the consideration of sex psychology, they are still a minor factor in the whole situation. They are congenitally abnormal. The revolting crimes of the degenerate are sporadic. The offences of the pervert damage individuals in restricted limits. The mentally defective, especially the female of moron grade, is a social and moral menace. Lacking ethical sense and moral standards, without inhibitions and with heightened sexual impulses, she is the easy victim of the lecher; the debaucher of young boys; very often the unmarried mother of widening circles of the unfit. She is the most prolific source in diffusing venereal disease. For self-preservation society must to the fullest limit possible prevent the reproduction of these unfit.

Individuals differ in the balance and vigor of function in the various endocrine organs, both in the normal and abnormal or diseased physical state, in the sexual and all other spheres of the human organism. And all of our functions have a dual purpose, one to serve the utilitarian needs of the body, the other to give aesthetic values, enjoyment, and satisfaction. This is true of the mental faculties, of sight, hearing, taste. One of this group of functions of dual purpose is that of sex. And it should be kept in its place with and of that group, and not set aside by itself under a spotlight of special and exaggerated attention. But because of its relationship to creation and the infinite, as well as to the state of society, controlled and regarded accordingly; with the chief purpose always that of reproduction. A recent writer has been so bold, however, as to assert the opposite, which would place man on a plane more gross than the lower animals.

While those of greater vigor of function and those with fuller supply of energizing vitamins may be subject to what is sometimes called greater biologic urge, they are also endowed with the faculties of mind, will power, reason, conscience, ample for self-control and right sex morals. To say that "The ruling passion, be it what it will, the ruling passion conquers reason still," is no valid excuse. The emotions should and can be held under the control of the intellect and the will, in the normal human being.

In considering the important factors bearing on the present state of sex psychology and conduct we cannot leave out of account that strange doctrine denominated psychoanalysis which predicates, as the well spring of all human motivation good and bad, normal and abnormal, the "libido." Self-expression, especially sexual, must not be restrained or repressed. For all the functional nervous ills of life will be the penalty of the exercise of repression and self-control. And some horrendous "complex" or "fixation" will lay hold upon, dominate and make miserable the whole course of life of the luckless individual. Suicide has been its not infrequent end-product. Many a life has been blasted by its teachings. And the ultimate and perfectly logical application of the advice given by its devotees to the patient, though unbelievable, is stark fact. That is, that say a married woman, in middle life, a high-minded fine character, mother of several children, is advised that her state of mental depression is the result of deadened sexual emotional life which must be aroused or there will be no recovery. That she must play the role of mistress to her husband, and if that should not accomplish the rousing effect, then she must seek relations outside of wedlock. Such advice as that strikes at the very foundations of society, the home and moral integrity. It is one of the potent disintegrating forces undermining sexual morality throughout the world. Based on fantastic false premises, arriving at equally false and often tragic conclusions it approaches the truly paranoic in its entire content. One writer not long ago referred to it as "Now a largely discredited fad but still a devastating force," and Dr. Frederick Peterson stigmatizes it as a "voodoo religion."

Another important factor in the continuing decline in moral standards and conduct must be recognized in the automobile. Highly useful, it is also highly destructive, and not alone or most importantly to life and limb. It is the supreme expression of the speed and high tension at which all life is moving at present. A speed and tension that is destructive of stability to the individual and society, jades the nerves and palls all the experiences of life. It is all too easily accessible to youth, the exhilaration of its smooth glide; the seductiveness of its deep cushions, the readiness with which it reaches the secluded lane, the tavern or the road house, are not sufficiently recognized by parents as powerful moral hazards. There is moral menace in the accessibility of the road house or tourist camp with omnipresent liquors to steal away discretion, and self-control, to inflame the baser passions and remove inhibitions. And common report indicates that contraceptives are readily available at filling stations. Incidentally it may be here remarked that the dances of a people are not only an indicator of moral attitude but also highly important in moral effects. To any one whose observation is more than superficial, modern dancing and music are significant.

One of the most powerful influences on morals, and one of the most difficult to control is that of the printed page. The recent vogue of salacious literature indicates both putrid moral concepts on the part of the writer, a deplorable level of taste on the part of the reading public, and an undermining effect on all morals. Under the guise of scientific purpose the mails have recently carried announcements of volumes, supposedly restricted to professional channels, but purely pornographic, which should be denied transmission by alert postal authorities. One of the most morally poisonous products of modern life is the cinema with its unending presentation of sex sewage that is passed before the eyes of all ages, from the youngest, with demoralizing effects beyond estimate. One wholesome and encouraging sign has illumined the sombre shadows in the recent action started by one of our great religious denominations, followed by others.

The moral miasma in the suggestiveness of the printed page or the pictured screen has a destructive influence on character of both young and old that is profound. In our sanitary precautions concerning physical health we exercise the utmost care, while little heed is paid to seeing that the moral atmosphere in and around the home and elsewhere is made and kept pure. The continually increasing numbers of unmarried mothers with all that it connotes to the individual, the home, society: when given the thought it merits; is just one of the indices of the situation. If it had not been for gradually subverting and undermining effects of varied moral hazards their final moral ruin could not have come.

For "Vice is a monster of so hideous mien,
That to be hated needs but to be seen.
But seen too oft, familiar with his face,
We first endure, then pity and at last
embrace."

Medical Care in Social Security*

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WHEN one thinks of "social security" one visualizes a state when the individuals therein live without fear; where fear of unemployment, fear for the future of one's family, fear of inability to obtain medical care when required, and fear of a penniless old age, is removed. Most states of the union, and most provinces of Canada now make provision for the unemployed; and many are considering insurance for this purpose. Most of them provide allowances for widows with dependent children, and make provision for old age pensions, yet no where on this continent can I find a system of medical care for all the people of the state in operation as a state venture.

In Western Canada, one of our greatest problems in the social security of the individual and the state is the provision of adequate medical services; or rather in having adequate medical services readily available for all our people. Much of our country is sparsely settled, the nearest doctor is many miles away from most homes, and frequently on this account the cost of medical service is prohibitive. In view of these facts, the individual and the state have canvassed ways and means of overcoming the difficulty, and the result has been that many communities of the prairie provinces have tried to provide themselves with medical service by means of taxation.

One province—Alberta—has passed a statute for the provision of medical services for the whole province on an insurance basis. The act is very comprehensive and makes provision for a complete service, which may be put into operation in any district at the request of the district. It was the hope of the Alberta Health Department to have the scheme in operation in two districts as a trial during the past summer, but the advent of a Social Credit Government has held their plans in abeyance for the time being.

British Columbia, although not a prairie province, has had the same difficulties in reference to adequate medical care, and they have on their agenda for the present session of the legislature a "Health Insurance Act." The provisions of this act make it possible to start with the minimum type of service, namely, a general practitioner service, and, as conditions permit, to add hospitalization, surgery, specialist, drug and dentistry services. In this way the service will ultimately be complete. The act, as drafted, applies only to those with an income of less than $1,800.00 per annum.

Saskatchewan, for many years, has had a form of state medicine in operation in a great number of its municipalities, under a plan known as the "Municipal Doctor System." Manitoba has also some municipalities covered by the municipal doctor scheme. As the name implies, this is the employment of a doctor on a salary basis by the municipality for the purpose of rendering medical attention to its residents. A municipality in the Canadian West is the unit of local administration and consists of an area of from 250 to 350 square miles with a population of about two thousand people, and is usually a farming community with possibly a village or two within the area. In both Manitoba and Saskatchewan, any fifty ratepayers of a municipality can present a petition to the municipal council requesting the appointment of a municipal doctor. The council is then compelled to prepare a by-law for this purpose, and give it first and second reading. The by-law is then submitted to a vote of the ratepayers and is declared "carried" if two-thirds of those voting, vote in favor of it. If there should be one or more physicians practicing in the municipality, provision is made on the ballot for the ratepayers to express their desire as to whether or not the resident physician, or one of the resident physicians, shall be engaged. This latter proviso is for the protection of any medical men who may have set up a practice in the community, and would stand to lose their livelihood if an outside doctor were engaged.

The salary of the physician is raised by taxation on the land, and ranges from $3,500 to $5,000 per annum, depending on the size of the municipality and the number of its residents. The doctor is responsible for all expenses in connection with the service, such as transportation, telephone, office rent, and equipment. He is supposed to spend all his time in the practice of his profession within the municipality, and to render to the people any medical attention they may require which can be given in the home of the patient, or in the office of the doctor. He is, however, allowed to charge the individual patient for drugs, or dressings, supplied.

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His duties include maternity work, and usually, minor surgery, such as the removal of tonsils, but do not include major surgery, specialist services, hospitalization or drugs. He is engaged by the council, which is composed of laymen, and he is directly responsible to them. You will immediately see that this placed the doctor in rather a peculiar position. Actually, he was subject to the dictates of the councillors, and to retain his appointment might have had to curry their favor. This, in some instances, used to lead to a considerable amount of abuse. However, the legislation governing this type of medical practice has been lately changed, whereby the medical man, we believe, is given ample protection. Now, any contract entered into between a municipality and a doctor has to be approved by the minister of health and public welfare; and if the doctor should be dismissed by the council he has the right of appeal to an independent commission. One can readily see that if this type of medical service is to be what it should be, it will require the closest coöperation between the residents of the municipality and the doctor.

Notwithstanding the disadvantages and the limitations of the municipal doctor system of medical service, it has filled a real need in many communities, and more particularly in those areas where it was impossible to get a doctor to locate on his own.

From a public health standpoint this type of service has many advantages. The municipal doctor is always the local medical officer of health and he finds it to his advantage to carry out his duties efficiently. Communicable disease control in these areas is very complete. The whole child population is kept vaccinated against smallpox and immunized against diphtheria. As a result, in the province of Manitoba there has been no case of smallpox in any municipality since the inception of the scheme in that municipality; and, in five municipalities no case of diphtheria. In the other two municipalities, which employ municipal doctors, there have been four cases of diphtheria, three of which occurred during the first year the municipal doctors operated.

Pre-natal and post-natal services are also very satisfactory and maternal deaths are rare. I would like to quote from a letter which we received from a municipal doctor:

> "I practiced in this district as a private physician before taking the appointment as municipal physician. I was not called to five per cent of the maternity cases and did not get the opportunity of giving any pre-natal care. Maternal deaths were a common occurrence. Since my appointment as municipal physician I attend all maternity cases and am able to give pre-natal care in 95 per cent of cases. Maternal deaths have entirely disappeared."

This in itself, we think, fully justifies the municipal system of state medicine.

In the province of Saskatchewan, over one-third of the rural municipalities get their medical care this way. In the province of Manitoba, we have seven municipalities covered, and the prospects of three or four more being brought into being during this year. One may ask, does this type of work appeal to medical men? The answer is "Yes." I say this in view of the fact that fourteen applications were received by the last municipality which advertised for a physician, and many of these were from well-trained, comparatively young men. To my mind, this type of work requires a particular type of medical man—namely—a well-trained young man preferably with post-graduate work in public health, who will have as his ideal "the utmost in good health for all those in his area." In other words, the up-to-date, well-trained, conscientious family physician. It is our hope in Manitoba that our municipal physician will, within the next three years, all have obtained special post-graduate training in public health. Already three have done so. This worthwhile piece of work is made possible by the generosity of that great American institution—the Rockefeller Foundation—and Manitoba is truly grateful.

However, this system makes no provision for the costly part of medical service, such as hospitalization, surgery and specialists; and we have prepared plans with the co-operation of organized medicine for a complete scheme, which, as soon as finances permit, we hope to try out in one or more selected areas; believing it would be the height of foolishness to embark on a province-wide plan of state medicine until we have more information as to administration difficulties, costs, etc. We trust this coming summer will see a start on this new plan which will give to the individual free choice of doctor, surgeon, specialist, and hospital; and will supply as complete a medical service as it is possible to obtain under medicine as we know it today.

Briefly, what we propose is this: that in the area or areas selected, the residents will obtain their medical services as in the past, having free choice of doctor, surgeon, and hospital. The doctors, hospitals, *etc.*, will send their bills to a medical advisory board together with the necessary completed forms so that the board can consider the accounts for payment. The accounts, after they have been approved by the board, will be paid by the municipality. Organized medicine has agreed to a lower schedule of fees than the one now in general use, owing to the fact that there would be no bad accounts.

We have had in operation in Manitoba for two years now an unique scheme of medical care for our unemployed. After over a year's negotiations between organized medicine and the Relief Commission of Winnipeg, an arrangement was entered into whereby the city agreed to pay doctors for services rendered to those in receipt of unemployment relief; the medical men accepting fees of about one-half the regular rate in view of the fact that the taxpayers' money was providing the service. The patient has free choice of doctor and hospital, but, excepting in the case of an emergency, has to secure authority from the city medical relief officer before calling his doctor. The doctor, in turn, has to fill in a medical form giving information as to the amount and type of service required, and rendered, and send it into the relief office. All surgery, *etc.*, excepting the cases of dispute as to the treatment required or rendered, may be referred to a medical advisory board, which is composed of the medical officer of health, the medical relief officer, and two members of the Manitoba Medical Association; so that the operation is under complete medical control. The service has been so satisfactory that as yet there has not been a single complaint as to the type of service rendered either from the city relief commission or from any unemployed person.

The scheme embraces approximately 50,000 persons and has been in operation for two years. We are gaining information from the forms being submitted by the doctors as to the amount and type of illness in our population and as to the cost of treating it. Likewise much valuable information is being gathered as to administrative practice. A survey of the first year's operation has brought out some striking points, among which are:

1. That people, in many instances, demand and sometimes receive, more medical attention than they actually require, or more than is good for them.

2. That a proper scheme of health insurance, if you like to call it that, will, without doubt, considerably reduce serious illness.

3. That it would appear the general death rate can be materially reduced by a properly supervised state system of medical care.

4. That the morbidity and death hazards of childbirth can be decidedly curtailed—in this group of people the maternal mortality rate for the first year was fifty per cent lower than in the rest of the city's population.

5. That the most effective control of any such scheme is complete, unbiased medical control free from political or other interference.

Other unemployed persons besides those in Greater Winnipeg also receive medical care. Those who are the direct responsibility of the province, *i. e.*, those who although domiciled in the province, had no municipal residence, receive this service under the supervision of the Department of Health and Public Welfare, and the service is practically complete.

There is another group in the province who also get a complete medical service, including hospitalization, surgery, and specialist care, drugs and dentistry. This is a group of people scattered all over Manitoba on farms, and is composed of families who have been on relief but are now placed on farms under the rural rehabilitation scheme. This scheme is an attempt to take certain selected families permanently off relief by financing them on farms for two or three years until they become self-supporting. In passing, I would like to remark that this plan seems to be the only really constructive scheme in our whole relief problem. These people, some 5,000 in number, have free choice of doctor, hospital, dentist and druggist, and the service as rendered is complete. The scale of fees is higher than in the Winnipeg plan and would appear to insure the doctor, druggist and others a bare living. This service is supervised by the Department of Health and Public Welfare, and all accounts have to be approved by the department before payment is made.

In Manitoba there are large areas of unorganized territory; *i. e.*, districts in which there are no municipal organizations, and the social security of the residents is the responsibility of the Department of Health and Public Welfare. Amongst other things, we have to make provision for the medical care of the indigent people, and in order that we may have direct contact with them we have all these districts covered by our Public Health Nursing Service. The nurse spends her whole time in her area advising the people on health matters, inspecting school children, and investigating outbreaks of disease. She also arranges for, and assists at, immunization and dental clinics. Each nurse is trained and equipped to give aid in case of emergency. She reports on the need of medical care and hospitalization in individual cases and when required makes provision for such. In the most inaccessible districts, the Department of Health and Public

Welfare subsidizes doctors to locate and pays them for any services rendered to indigent persons. At five outlying points we have established nursing stations, each in charge of a registered nurse with special training in midwifery. These stations are all subsidized by the government; three being operated by the Canadian Red Cross Society and two by the Public Health Nursing Service of the department.

The indigent in our province suffering from mental defect and disease; from venereal disease, and from tuberculosis, all receive medical care at the expense of the state. Our Indian population receives this care through the Federal Government. At the present time; the state is responsible for the medical care and hospitalization of over one-fifth of our total population of 725,000 persons.

With the knowledge we have already acquired, and with that which we hope to acquire within the next year or two from our trial schemes, what do we visualize for the future of medical care in Western Canada? When I say *we*, I not only refer to the Department of Health and Public Welfare, but also the public and to organized medicine. All three, I believe, look forward to the time when the most that medical science has to offer will be readily available to every one of our citizens. An ulcer in the poor man's stomach takes as much time, trouble and expense to diagnose and cure as an ulcer in a rich man's stomach. Therefore, provision should be made for the poor man to get this service. We feel that funds for an adequate medical service to all can best be obtained by some form of compulsory insurance for all those under a certain income level. We further believe that the present system of medical practice which has survived our changing civilization for so many generations must have a great deal of merit, so that any scheme put into operation should disturb as little as possible the present relation between doctor and patient. We believe the doctor should be paid for all services rendered, on a fee basis, as competition, which is so essential to the highest type of medical practice, must be maintained. And lastly, we believe the control of any scheme should be unbiased part state health and part organized medical control; and that such control should be divorced absolutely from politics and free from political or other interference.

Insurmountable obstacles, you will say. We think not. Rome was not built in a day, neither will the ultimate satisfactory scheme of state medicine be evolved in a few months. I would like to quote from a radio talk given by Dr. E. S. Moorhead, who has had wide experience with our medical problem in Manitoba as chairman of the Committee of Organized Medicine which negotiated the scheme for the medical care of Winnipeg unemployed, and also as chairman of the Committee on Sociology of the Manitoba Medical Association:

"We must know a great deal about the general population and its ailments before we can discuss the subject (health insurance). Granted that the census returns will tell us age, nationality and occupations, that vital statistics will give the cause of death, and health officers the infectious diseases, we are still left with many gaps. The length of disability due to illness becomes of great importance, especially if you are going to give cash benefits, as in workmen's compensation cases. The incidence of illness will be different as between industrial and rural populations, and as between nationalities. It is well known that some races have a greater susceptibility to certain illnesses than others, but we have few accurate statistics. Does the transplantation of some of these races to Canada alter the susceptibility? To what extent is the amount of illness affected by economic conditions? Off hand, one would say that it is likely to increase at the present time; yet surveys of the unemployed on relief in Winnipeg suggest that the health of these people is better than the average.

"If we know the answers to all these, we can submit them to actuaries who will tell us how a medical service can be supplied to our mixed population, and what it will cost. If, as it happens, we do not know the answers, then a dozen royal commissions will not provide them.

"It appears that we must approach the problem by trial methods. It would be quite feasible to set up small, self-contained units here and there throughout Canada. Groups of from 2,000 to 5,000 could have a medical service provided over a 2-3 year period. The cost of these would be provided largely by the beneficiaries through assessment or taxation; assistance would probably be given by federal or provincial governments, or both. In return for this assistance, records would be kept in such form that actuaries would have a basis for estimating the cost of a provincial or nation-wide system. It would then be for the people to decide if they wanted health insurance and were prepared to pay for it."

We also believe that the most satisfactory method of ensuring a solid foundation for state medicine will be the trial method; start in a small way, find out the difficulties, overcome them as they arise, and gradually enlarge the scope of the scheme until our whole province is covered. This will not be done this year or next, but in my opinion, as sure as the sun sets tonight, the time will arrive when we will have the satisfaction of seeing in operation in Manitoba a system of a complete, state-supervised, medical service for every man, woman and child who are unable through their own resources to obtain the medical care they require.

For many years organized medicine in Manitoba has been studying ways and means of making medical service more readily available to all our people. The depression has emphasized the need. It would seem that the considered opinion of the Manitoba Medical Association, as indicated by the presidential addresses during the past six years, is that the most satisfactory and complete service can best be obtained by some system of compulsory health insurance. We in the Department of Health and Public Welfare are particularly fortunate in that the Manitoba Medical Association has as permanent chairman of its Committee on Sociology a man of Dr. Moorhead's character. He is as much concerned with protecting the recipient of medical relief and the taxpayer as in putting forth the claims of the medical profession, and it is chiefly due to his untiring efforts and unfailing fairness that our whole scheme of medical relief to the unemployed runs so smoothly.

Your great Northwest is the grown-up brother of our own Western Canada. The problems in reference to medical care must be somewhat similar, but because of your greater resources your difficulties are possibly not so acute. However, now is the time, while funds are available, to do your experimenting. If your legislation is generally interpreted as broadly as ours, it would seem to me that Section 702 of your "Social Security Act" gives ample powers to the board to recommend the allocation of money for a trial, in a limited area, of some system of state provision of medical service. I feel sure that if public funds had been available in Manitoba during the past two or three years, we would have on hand ample data from trial areas to permit us to draw up a satisfactory and economically sound, province-wide scheme of state medicine.

I would again urge you to remember that the utmost in the provision of medical care for the security of the state can only be accomplished by the wholehearted coöperation of the public, the official health agencies and organized medicine; and no scheme of medical care should be considered by the public unless it has the endorsation of the health authorities and organized medicine.

Use of X-ray in Kidney Conditions

L. R. Parsons, M.D.
Elbow Lake, Minn.

PROBABLY in no other branch of the practice of medicine has the roentgen ray added so much to our knowledge of pathology in the living as in the study of diseases of the kidneys. I refer to the so-called "surgical" diseases of the kidney, which is to say all affections except the nephritides.

In some diseases (renal calculus, some new growths, for instance), there is furnished by X-ray a direct visualization of the pathology, by simply taking a flat plate of the region. In most, however, pyelography of one kind or another is necessary for a proper interpretation of the changes or their localization, but it is of retrograde pyelography I wish particularly to speak, hoping to add a few remarks about excretory pyelography later if time permits.

A word about the contrast medium which is used. A solution of sodium iodide was the first to be used to cast a shadow of the kidney pelvis, but this is somewhat irritating to the mucous membrane and often causes pain when injected. There are other preparations obtainable which are less irritating and less toxic, so the former is very rarely employed at present. Hippuran, skiodan, neo-skiodan, diodrast, *etc.*, are some of the newer drugs available which are safely used for retrograde pyelography, and give very satisfactory results with little or no irritation of the mucous membrane, and no untoward results following a pyelovenous back-flow, if such should happen, because they are all prepared for use intravenously.

There are probably no absolute contraindications to retrograde pyelography if necessity demands; but one should weigh the following tentative contraindications against the need for this procedure.

1. Bilateral renal disease. Especially acute nephritis, where instrumentation would probably do harm and where the injection of a foreign fluid into the kidney pelvis might be dangerous.

2. Acute urinary infection. Usually the necessity here is not urgent, and harm might be done by pyelography. Instrumentation of the ureter and kidney pelvis is possible, often advisable according to some urologists, in acute pyelitis, but urography is not likely to teach us much of this condition in the acute stage.

3. In cases of solitary kidney, one should be careful about retrograde pyelography lest it cause a urinary suppression, but this is less likely now than formerly, when the more irritating medium was used.

4. Advanced age is not an absolute contraindication, but one should be more careful here.

5. It would be well not to inject the kidney in the presence of high temperature if it can be avoided, as it most always can.

The conditions which are revealed by pyelograms are best divided into five major groups, and while two or more of these separate conditions often exist together, the prinicples of diagnosis underlying each are quite separate and distinct, so I shall treat them independently.

Let us look at the roentgenogram of the normal kidney as a basis for study. While there is great variation in normal pelvis, it has been proved through study that the following may be considered normal. There shall be one true pelvis. There must be two, at least, major calyces—only one would be an abnormal condition. There may be any number of minor calyces. The capacity of the pelvis as compared to that of the calyces is important, and will be enlarged upon. The terminal irregularities of the calyces must be present, otherwise there is something wrong. The superior minor calyx should reach to or above the 12th rib if the kidney is to be considered in normal position. The calyces should point outward, upward, or downward—not inward from the renal pelvis. The lines in the pyelogram which enclose the contrast medium should be clear, unbroken, and free from fuzziness, or greater irregularities.

The pathological conditions to be considered may be classified as: (1) infection, (2) obstruction, (3) calculus, (4) new growths, (5) anomalies and malpositions.

Infection

I don't mean to say that we are dependent upon X-ray for diagnosis of infection in the renal pelvis and kidney any more than I would discount the importance of physical, chemical, or bacteriological studies in cases of suspected kidney pathology, but these are without the scope of this discussion. What I do say is that infection in the pelvis and calyces of the kidney brings about changes typical of infection as the causative factor, and these changes are demonstrable as distinct and apart from changes from other causes.

The earliest demonstrable radiographic change in the kidney due to infection takes place in the calyces. It may be local in one minor calyx only, and be simply a loss of the clearness of the line—that is—a fuzziness or moth-eaten appearance, or a dilatation of one minor calyx, or a distortion or loss of the terminal cupping of the minor calyx, or actual cavitation. It may be common to all calyces, and when dilatation or apparent dilatation occurs, we have a change from the normal relative capacities of combined calyces as against the capacity of the renal pelvis. In other words, when the combined capacities of the calyces are much greater than capacity of the renal pelvis, infection is the cause, rather than obstruction, which reverses this picture in the early stages. Infection by tuberculosis conforms in general to the rule propounded thus far, but there are changes peculiar to tuberculosis.

In this latter disease, the involvement is very apt to be local at first. The radiograph early shows a blurring of the calyx outline, a slight moth-eaten appearance due to the beginning destruction of the surface of a papilla. As the disease advances, cavitation begins at the expense of kidney tissue. Terminal cupping of the minor calyx is lost, and what was a true dilatation in other infections is really cavitation in tuberculosis. One calyx may be affected rather markedly before the others are involved. Calcification is often present in this infection and these deposits are easily seen in the X-ray picture.

Obstruction

The factor causing obstruction may be immediately shown on the pyelogram or even on the flat plate. They are numerous and varied as to their nature. Calculus, congenital narrowing of the urinary tract at any point from the renal pelvis to the external meatus of the urethra, kinking of the ureter from displacements, scarring from within or without the ureter, new growths, aberrant blood vessels, *etc.*, are the common causes, but whatever the cause, the change in the renal pelvis, calyces, and kidney takes place in, one might almost say, an orderly manner. Quite as one would expect, the first noticeable change is dilatation above the point of obstruction. In the kidney itself, the pelvis bears the brunt of the back pressure in protection, as it were, of the more important calyces and renal papillae. The capacity of the pelvis usually enlarges considerably before the calyces show much change, and here is the point of differentiation between the results of infection and those of obstruction. If the capacity of the renal pelvis is much greater than the combined capacity of the calyces, obstruction was the causative factor. If the obstruction remains unrelieved, the calyces of course suffer, the terminal irregularities are lost, the major and finally the minor calyces enlarge at the expense of kidney tissue, and the condition goes on to hydronephrosis, where the pelvis and calyces lose their identity as individual structures and merge into a single large sac, fluid-filled and surrounded by a thinned cortex of kidney tissue. The pyelogram of a hydronephrotic kidney is not dissimilar to that of an advanced pyonephrosis.

Calculus

In calculus disease of the kidney, the X-ray has taught us nothing of the cause, but it has helped materially in, not only the location of the trouble, but also in the study of the fate of the organ so afflicted. Most calculi are radiopaque; some are not. In the former, a flat plate shows the shadow and it remains only to differentiate it from other shadows and to accurately locate it.

The conditions which might be mistaken for renal (or ureteral) calculus are: (1) calcified mesenteric lymph nodes. These are usually above the creat of the ileum. (2) On the right side, gall-stones. (3) Enteroliths. (4) Radiopaque substances in the bowel. (5) Skin pigments.

A calculus in the kidney calyces or pelves or in the ureter can usually be proved simply enough by use of the X-ray opaque catheter up to the stone, (or a pyelogram) the use of shift position to prove the shadow in the urinary tract. The non-radiopaque stones are not so easy of diagnosis but by use of an opaque medium of greater density than the calculus will often prove its presence.

New Growths

New growths of the kidney and kidney pelvis may offer more difficulty in diagnosis than any of the conditions thus far mentioned. Of course, in the case of massive involvement of the kidney by carcinoma, or replacement of the kidney form by hypernephroma, the tumor mass will usually cast a shadow on the flat plate which is distinctive. Combine this with a pyelogram, which usually shows a greatly distorted pelvis, and we are reasonably sure of our findings. In short, kidney and pelvic neoplasms are typified by the following characteristics in the X-ray picture: (1) Enlargement of the kidney shadow. This may be of one or the other pole only, regular or irregular in outline. (2) Distortion of kidney pelvis and calyces. (3) Elongation, flattening or tortuosity of one or more major calyces. (4) Displacement of a calyx or calyces, often very clearly suggesting the pushing aside of these structures by some enroaching mass. (5) Filling defects in the contrast medium in the renal pelvis.

Anomalies and Malpositions

In an attempt to diagnose anomalies of the kidney, the pyelogram is the greatest single aid. Indeed, many if not most, anomalous conditions can be demonstrated directly, leaving nothing to be deduced from what we see. The fused kidney with its typical hammer-head upper calyx and normal lower calyces can usually be clearly demonstrated by pyelogram unless there are two ureteral orifices. These are usually seen through the cystoscope, although both may not be. If the lower one is injected, we have the upper calyx filled, for according to Meyer's law, this always opens from the upper half of the kidney. If the upper orifice is injected, the appearance of incompleteness of its lower half would surely be suggestive of fused kidney. If two ureteral orifices are seen on one side they should both be filled with opaque medium—if two ureters unite before entrance into the bladder, both pelves will be filled together.

Horse-shoe kidney *may* be seen on the flat plate, if not, the pyelogram would show suggestive alteration from normal, *i. e.*, possibly a tipped appearance of the kidney and probably an inward turning of the lower calyces toward the spine, often touching it. The characteristic sweep of the ureters, the flower vase conformation of Guiterez, are all typical.

In polycystic kidney (which is not truly anomalous), we have two types of pyelogram. The compression type with long narrow irregular or bent major calyces, and the cavernous type, with large pelvis bizarre in shape.

We have then the disk kidney, the ectopic kidney with a congenitally short ureter, supernumerary kidney, solitary kidney and aplastic kidney, each of which can often be visualized with X-ray.

As to malpositions of the kidney, I have only to say that if the kidney is demonstrable by X-ray at all, its altered position can be seen of course; but what is more important, it can be demonstrated whether or not the kidney moves with a change of position of the patient from horizontal to vertical. Often this simple procedure technically proves the presence of an obstructive kinking of a ureter when the patient is in the upright position.

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INTER-STATE POSTGRADUATE ASSEMBLY

Aristotle's peripatetic method of teaching his disciples has been adopted in modernistic style and setting by the Inter-State Postgraduate Assembly whose instructors go about from place to place to enlighten those who would listen and improve. The public auditorium in St. Paul will serve as the Lyceum for the next gathering and the week of October 12, 1936, is the date.

The Assembly has held meetings in the twin cities before, and the profession of the north central states showed their appreciation by a large attendance on each occasion. It has been said that he who talks can only repeat that which he already knows while he who listens may learn something. Everyone who registers for these scientific meetings casts thereby a vote in support of that statement.

We publish the program in another part of this number and it should be lure enough. Minneapolis will be pleased to welcome those who find it convenient to put up in her midst. Bus and street car facilities between the two cities are ample and convenient. There is but one rivalry between the physicians, namely, who best can serve the fraternity and humanity as a whole.

A. E. H.

SALESMANSHIP IN MEDICINE

Certainly there is an important place in the practice of medicine for the practical application of psychology or salesmanship. The real value and aid of a clean, light, airy, cheerful office, a pleasant attendant, and a physician who is a good salesman cannot be over-estimated.

All too many doctors neglect personal appearance, facial expression, pleasant voice, enthusiasm, and personal interest in the patient, which are the fundamentals taught every salesman. The direct relationship between the doctor and patient has been allowed to assume a scientific basis rather than to consider the patient as an ordinary human being, with the usual sentiments and emotional reactions. The sentimental and personal relationship between doctor and patient should be the most pleasant and most sought-after reward of a busy practice.

A clean, well-lighted, pleasantly furnished waiting room with small brightly painted chairs for children, comfortable chairs for the grown-ups, and up-to-date, untorn magazines immediately put the patient into a good frame of mind. A neat, attractive receptionist adds to this good impression.

All too often the physician himself has neglected his personal appearance, pleasant voice, and greeting only to leave a bad impression on the hypersensitive, sick patient. A deep, thorough, scientific fund of medical knowledge does not make up to the patient for the lack of medical personality. Let's have more salesmanship in the practice of medicine.

L. G. D.

DOMESTIC DISEASE DISSEMINATION

To the gentle reader who is a lover of dogs, we hesitate to pen these lines. No offense is intended; we love dogs too, and would only awaken a little scientific thoughtfulness along certain lines.

No one can read the Bar Sinister that Alexander Woolcott has included as one of the gems in his compilation of the *Woolcott Reader* without a tug at his heart strings.

Senator Vest's tribute to the dog contained some of the most beautiful sentiments ever expressed to a jury. That twelve good men and true were moved to tears in that little old Missouri court room is not at all surprising.

But when we read how at the height of his eloquence he said, "He will kiss the hand that has no food to offer, he will lick the wounds and sores that come in encounters with the roughness of the world; he guards his pauper master as if he were a prince," the imaginative medical mind senses an opportunity at rebuttal.

No one cares to endanger his popularity by calling the dog a *scavenger*, even though he sniffs in garbage cans one moment and kisses babies the next, but it might be excusable to suggest that dogs and other household pets could at times be the mediums of spreading disease in their intimate to and fro contacts. There was a time, not so long ago, when we did not know how malaria, typhus and yellow fever were transmitted and there are many disorders of a clearly infectious nature whose carriers are still unknown. Our little domestic gods do not guard us against these by their friendly perambulations. May our love for them not blind us to the possibility of danger.

A. E. H.

STATE MEDICINE

All indications point to a determined effort by a number of endowed foundations, aided and abetted by the present federal administration, to force socialized, or state, medicine upon us.

Far too much progress has already been made along this road—note the Federal "Corrective" program of 1934, the FERA, CCC, WPA, and welfare boards, all agencies dictating medical and surgical fees of ridiculous proportions. The latest Federal step is in relation to the resettlement, drouth relief, and WPA families, wherein $1.50 per month per family is proposed, and offered with a "take-it-or-leave-it" attitude, to cover *all emergency* medical, surgical, dental and hospital fees; and for good measure the drug bills for the same are to be included in this amount! All other than "emergency" cases are at the expense of the "client" whose wage or grant is so meager as to preclude payment, hence they become "charity" cases so far as we are concerned.

The "new-fangled" agencies created by the last Congress, based upon federal dictation of joint federal and state social services: "Child Welfare," "Crippled Children" and "Maternal and Child Health," expect Physicians and Dentists to either donate their services or accept beggarly fees—each is an additional step to—or in—state medicine, according to your viewpoint.

The fact that all other vendors of necessities receive regular prices for their wares corroborates our belief that a deliberate attempt is being fostered by the federal administration to force our acceptance of state medicine, in spite of its universal failure to decrease deaths and illness disability in those nations which long ago fell for the wiles of its sponsors, and its debilitating effect upon scientific practice and progress in the medical arts.

This critical condition needs and demands the help, and careful consideration, of every member of the medical and dental profession, to dam its insidious advance, or we shall be faced by an accomplished fact when we awaken.

W. A. G.

MORE INFORMATION NEEDED CONCERNING HAY FEVER CAUSES

Thousands of hay fever sufferers each year receive injections of pollen extracts on the basis of data which are inadequate and antiquated. Marked variability and inconsistency as regards results support this statement. The present data consist for the most part of lists of plants compiled from botanical works and relatively superficial field surveys.

The daily determination of the kinds and amount of pollens which pollute the air without doubt is the only method so far devised which gives exact data concerning the potential causes of hay fever for individuals residing in any given locality.

That pollen is the cause of hay fever was proved by Blackley in 1873 and the presumption that any pollen-producing plant is a cause of hay fever was a natural sequel to Blackley's discovery.

However, this hasty application of Blackley's conclusions led to many erroneous notions which to a certain extent still prevail, especially but not entirely, among the laity, involving such plants as roses, goldenrods, dandelions, etc., as causes of hay fever. An important advance was made in 1917 when Scheppegrell pointed out that only those plants which by nature depend upon wind for pollination are important sources of hay fever causing pollens.

Scheppegrell's contribution deserves emphasis since it provided the basis for the listing of the wind-pollinated and, therefore, the potentially true hay fever causing plants. Such lists have been prepared on the basis of field surveys for much of the U. S. A. but even this kind of knowledge is yet incomplete. Notwithstanding the certain value of this information it leaves much to be desired. It does not tell us whether or to what extent this air is polluted by the causes listed. The method of air analysis by means of pollen identification and enumeration furnishes the information desired. Only when data have been collected through an entire typical season or through several seasons can the medical profession of any locality be said to have a true and correct basis for the treatment of hay fever by pollen injections. Data of this character for the Twin Cities area and several other stations in Minnesota made possible through research studies supported by the Medical Research Fund are practically complete.

The current data aid the physician in verifying the correctness of his diagnosis as to the causes for individual patients by comparing the symptoms with the air pollen content day by day. Recently Minneapolis newspapers have carried daily reports of the data obtained from the University of Minnesota along with the Weather Report. These reports are of great value and the work should be perpetuated. But how? No longer a matter of research, it cannot receive support from Research funds.

Hay fever is an important public health problem since it affects two to three per cent of our population. Machinery not only for the determination of the wind-borne pollens for our whole country on the more exact basis of air analysis should be devised but also perpetuated. The problem looms large, yet it is not entirely infeasible. Pollen identification, although it requires training, is not attended with great difficulty. Equipped with a microscope it requires the properly trained individual only a few minutes to make the determination of the air pollen content for the preceding 24 hours. We already have in existence an agency ideally suited to the performance of this service. Through this the Weather Bureau could extend its already valuable services to the nation.

R. V. E.

BOOK NOTICE

TOPOLOGICAL PSYCHOLOGY

Principles of Topological Psychology, by KURT LEWIN, Ph.D., translated by FRITZ HEIDER and GRACE HEIDER; first edition, 205 pages plus bibliography and index, red cloth, gold-stamped, illustrated; New York City: The McGraw-Hill Book Company: 1936. Price, $2.50.

There are many physicians to whom the word "psychology" reacts as a figment from some occult *séance*. Medical men are not united in considering psychology a science; some physicians do not even look with respect upon a psychiatrist, *Medicinae Doctor*.

There is no doubt that psychology is what Professor LEWIN calls "a young science." Hence, any expansion or exfoliation of new methods of approach and technic may be highly significant. LEWIN, who was formerly professor of psychology at the University of Berlin, and is now professor of child psychology at the Iowa Child Welfare Research Station at Iowa City, was impressed with the mathematical discipline of topographical anatomy, and wondered how it might be applied to psychology.

That this work is the result of much serious thought is evident. Some of the concepts promulgated are vague, and the methodology is not always easy to follow, probably because European learning in this particular field is generally in advance of U. S. achievements. But Professor LEWIN's tenets are well-established, and his writing arouses confidence.

REPORTS OF SOCIETIES

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Fergus Falls, Minn.

More than 100 physicians registered on the opening day of the annual meeting of the Northern Minnesota Medical Association, held at Fergus Falls, August 31 and September 1, 1936.

The meeting opened at 9 a. m., with an address by Dr. W. Stafne, Moorhead, on "Recent Advances in Diabetes Mellitus." Dr. Stafne in his address mentioned the outstanding achievement in the treatment of diabetes since the discovery of insulin in 1922 by Banting and Best. This is the preparation known as protamine insulinate, introduced by Hagedorn, of Copenhagen, Denmark. The preparation is found to be a valuable adjunct to insulin in treating severe diabetes.

Dr. H. S. Diehl, of the University Medical School, spoke during the forenoon on "The Medical School and the Practising Physician."

The next speaker, also from the University, Dr. O. H. Wagensteen, spoke on "The Significance of Anatomical Features of the Vermiform Appendix in the Genesis of Acute Appendicitis." The speaker said that obstruction and infection are probably the chief causes of acute appendicitis.

The Monday afternoon program was given at the State Hospital by Dr. W. L. Patterson and his staff. One of the staff members, Dr. L. W. Katzberg, gave a talk on "The Schizo Phrenic Reaction," stating that this form of mental disorder effects especially the emotional life and personality of the patient. About 21.3 per cent of the beds in all of the State Hospitals in the country are occupied by patients suffering from this type of mental disorder.

Following the Neuro Psychiatry Clinic, several interesting papers were listened to with much interest. Concluding the afternoon program was a paper by Dr. R. J. Moe, Duluth, on "The Treatment of Infected Abortion."

On Monday evening the doctors with their wives and guests were entertained at a banquet at the State Hospital by the Park Region Medical Society and Dr. and Mrs. W. L. Patterson, Superintendent of the State Hospital. Dr. O. J. Hagen, Moorhead, acted as toastmaster, and proved beyond a doubt that there are few with his ability. The main speaker of the evening was W. L. Strunk, D.Sc., of Decorah, Iowa, chairman of Basic Science Board and Director of the Iowa State Conservation Board, who can be classed as one of America's outstanding conservationists. His address, entitled "Our Vanishing Hosts," was very educational. He is a fluent speaker and knows his subject well. One outstanding point in his address contained the following, "Wherever humanity has lived the longest and cultivated the soil, we now have nothing but desert today."

The closing addresses were given by Dr. W. W. Will, of Bertha, president of the State Medical Association, and Dr. A. N. Collins, president of the Northern Minnesota Medical Association. Dr. Collins' address, entitled "The Name of the Doctor," was a masterly plea for better co-operation, a more charitable feeling toward our competitors and find ourselves in greater sympathy with them.

Six papers occupied the Tuesday forenoon session, closing with a paper entitled "Some Fevers Difficult of Diagnosis," and a heart clinic by Dr. Moses Barron, of Minneapolis.

At the business session during the forenoon, Dr. O. O. Larsen, Detroit Lakes, was elected president; Dr. E. A. Heiberg, vice president, Fergus Falls; and Dr. J. F. Norman, secretary-treasurer, Crookston.

BIRTH CONTROL ORGANIZATIONS

Whether or not one believes in the philosophy of the so-called birth control movement, it is reassuring to examine the make-up of the medical advisory boards of the birth control organizations. The medical policies of the American Birth Control League have been placed under the supervision and direction of the National Council on Birth Control, an autonomous body made up of seventy-one well known physicians, most of whom are outstanding obstetricians and gynecologists. The main purpose of this autonomous council is to initiate, encourage and execute appropriate scientific research in the medical aspects of birth control. The Minnesota Birth Control League, an affiliate of the American Birth Control League, has a large medical advisory board whose make up should inspire confidence that nothing will be done by this organization contrary to the highest ideals of medical thought and practice. Personnel of these organizations is as follows:

National Medical Council on Birth Control

Executive Committee

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It is to be hoped that these organizations can and will establish effective methods of combating the advertising, exhibiting and the obtrusive purveying of various articles of contraception, even though the manner of this advertising and display, at present, may come within the letter of the law. It is felt by a large number of physicians and laity alike that such advertising and exhibits, under whatever name, in magazines, drug stores, etc., not only outrage public decency, but tend to be subversive of public morals. From a medical standpoint they are dangerous, because they suggest a degree of efficiency that the local physical condition of the user may render highly improbable, with possible dire consequences where contraception is indicated. Furthermore, they are often the cause of local pathology.

The Minnesota Birth Control League has established free Maternal Health Clinics, where married women may be examined by physicians and given perfectly harmless, and the most efficient contraceptive advice and instruction known to science, if their condition lawfully warrants the giving of such contraceptive advice. The latter decision is made only by physicians licensed to practice in this state as prescribed by the laws of the state; and these physicians are chosen by the medical advisory board because of their knowledge and training in this special technical field.

Enough scientific research has been done in this field to establish approximately the relative efficiency of different types of contraception. All researches show that contraceptives, although not one hundred per cent efficient, can be made highly efficient only after medical examination of each individual case and advice given according to conditions found. It is reasonable to predict that further appropriate research will continue to increase the efficiency of scientific contraception.

Experience tends to point with reasonable certainty to the conclusion that a large majority of the privileged members of society, who have taken seriously their responsibility in point of health and independence, have always made some attempt to use birth control, with varying degrees of success, dependent largely upon the character of their medical advice.

Experience in birth control clinics indicates beyond peradventure of doubt that a goodly portion of the remainder of society has often been forced to propagate against whatever sense of responsibility it has had, by a lack of knowledge due to its inability to obtain highly specialized medical advice. Thus there is every reason to believe that nothing but good can come from making it possible for the sickly, underprivileged and inadequate who believe in birth control and earnestly desire it, to limit their offspring as the privileged and adequate members of society have always done. That many of these inadequate people wish to limit their families is further evidenced by the number of self-induced and criminal abortions among married women in our charity hospitals. It is to be hoped that scientific contraception will reduce markedly the number of these abortions, with their terrible toll of mortality and morbidity.

Whatever rational doubt individuals may have as to the validity of the reasoned hypothesis held by many students of the science of society that birth control will prove to be a basic aid in decreasing maternal and child mortality and morbidity, in solving many social and economic difficulties that modern conditions have brought about, and in promoting eugenic results, there should be no rational doubt as to the wisdom of responsible medical supervision and direction of the medical aspects of birth control, and it is such medical supervision and control that the birth control organizations are using their influence to promote and establish.

NEWS ITEMS

CORRECTION

Through oversight in proofreading, the name of Dr. S. E. Sweitzer was omitted from the front cover of the September issue of The Journal-Lancet as associate editor of the special Dermatology number. Dr. Sweitzer did assist in the preparation of this number and we regret this error.

Minneota, Minn., will have a new hospital this season that will cost about $25,000 when completed

Dr. George Schartz, of Linton, N. D., has become an associate of Drs. W. G. and R. C. Brown at Fargo.

Dr. P. C. Pilon has returned to his offices at Paynesville, Minn., after spending several months in Europe.

Dr. and Mrs. B. O. Mork, Worthington, Minn., have recently returned from a two months vacation in Europe.

Dr. C. E. Sherwood, Madison, S. D., has been named health officer for Lake County, by the State Board of Health.

Dr. A. T. Jensen, Rugby, N. D., is spending several months in Philadelphia, taking a postgraduating course.

Dr. G. E. Whitson was re-elected president of the Community hospital staff, at its monthly meeting held at Madison, S. D.

Over 500 former patients of Glen Lake Sanatorium were in attendance at the seventh annual reunion held on August 29.

Dr. Thomas Broadie has been appointed superintendent of Ancker Hospital, St. Paul, to succeed the late Dr. S. R. Lee.

Dr. A. F. Bratrud, Minneapolis, was a guest speaker at the meeting last month of the Wisconsin State Medical Association.

Dr. Albert L. Perti, formerly of Windom, has become associated with Dr. L. J. Holmberg in general practice at Canby, Minn.

Dr. Andrew Paulson of Watertown, S. D., died last month after a long illness, the result of an automobile accident some years past.

Dr. Paul Scallin, who has been located during the past twelve years at Clark, has purchased the practice of Dr. F. H. Cooley of Redfield, S.D.

Dr. E. J. Simons, who has been spending several months at Ah-Gwah-Ching, has returned to Swanville, Minn., and will continue active practice.

Dr. Benjamin Thomas, Huron, S. D., was suddenly called by death on August 19. The doctor had been in practice in Huron for over 30 years.

Dr. R. V. Morledge, Billings, Mont., was a member of the Pan-Pacific Surgical Society, who attended a meeting at the Hawaiian Islands last month.

Dr. Robert Quello, has opened an office for general practice of medicine at Beresford, S. D. Dr. Quello is a graduate of the University of Minnesota.

Dr. P. C. Petersen, who has been located at Ogilvie the past two years, moved recently to Braham, Minn., and is now associated with the Braham hospital.

Drs. S. S. Steinberg, J. Thorkelson, Butte, Mont.; J. Vaska, Great Falls, Mont., and D. E. Hale, Rochester, Minn., have organized the Butte Clinic in that city.

Dr. W. F. Cogswell, secretary of the Montana State Board of Health, is back at his desk at Helena, after spending several weeks' vacation at the Hawaiian Islands.

Dr. J. A. Myers, Minneapolis, was a guest speaker at the September meeting of the members of the Rocky Mountain Tuberculosis Conference at Albuquerque, N. M.

Dr. H. A. Reimann, Minneapolis, associate professor of medicine, University of Minnesota Medical School, is now located at the Jefferson Medical College, Philadelphia.

Mr. A. G. Stasel, superintendent of the Nicollet Clinic, Minneapolis, was one of the guest speakers at the 11th annual meeting of the Association of Clinic Managers, held at Duluth last month.

Dr. Mary H. Brandrup died at her home in Mankato, Minn., on the morning of August 23, at the age of 66 years. Dr. Brandrup was a graduate of the University of Minnesota in 1901.

Dr. J. S. Kilbride, who has been in active practice at Canby during the past 40 years, has moved to Worthington, Minn. The doctor was given a farewell lunch by his large circle of friends of Canby.

Rev. Stephen E. Keeler, bishop coadjutor of the Minnesota diocese, officiated at the laying of the cornerstone of the $150,000 addition to St. Barnabas Episcopal Hospital, Minneapolis, last month.

In honor of Dr. O. H. Gerdes, who passed away during the past summer at Eureka, S. D., after serving that community for over 40 years, the citizens are to erect a monument to his memory.

The new officers of the Northern Minnesota Medical Association are: Dr. O. O. Larson, Detroit Lakes, president; Dr. A. E. Heiberg, Fergus Falls, vice-president; and Dr. J. F. Norman, Crookston, secretary.

Dr. John F. Regan, for the last seven years assistant superintendent of the North Dakota hospital for the insane, has resigned to take a similar position in the Howard state hospital for mental diseases at Providence, R. I.

Dr. O. G. Morehouse, Owatonna, Minn., died Wednesday, September 2, following a heart attack. A retired physician following more than 20 years of practice. Dr. Morehouse for many years had been a leading figure in civic and commercial activities.

Dr. H. A. Owenson, a prominent physician of Arnegard, N. D., was found dead in bed with an artery in his arm slashed. The doctor had been in ill health for several months, and had become very despondent over his physical and mental condition.

A bust of Dr. William J. Mayo of Rochester, executed by John K. Daniels, prominent Minneapolis sculptor, when cast in bronze, will be presented to the University of Minnesota. Dr. Mayo is a member of the board of regents of the University of Minnesota.

Dr. H. H. Holm, Glencoe, Minn., was awarded an inscribed medal by the Southern Minnesota Medical Association for presenting the best case report at the meeting, which was held at Albert Lea last month. One of these medals is awarded every year.

Dr. J. H. J. Upham, president-elect of the American Medical Association, was the guest of Dr. E. G. Balsam at his Billings home in August. A special meeting of the Yellowstone Valley Medical Society was called, when Dr. Upton addressed a large gathering of members of the society.

The annual meeting of the southwestern division of the North Dakota Medical Association was held at Richardton, on September 10. New officers elected were Dr. N. W. Schumacher, Hettinger, president; Dr. W. H. Gilsdorf, New England, vice-president; and Dr. A. E. Spear, Dickinson, secretary.

At the annual meeting of the Southern Minnesota Medical Society recently held at Albert Lea, the following officers were elected: Dr. H. C. Habein, Rochester, president; Dr. W. A. Merritt, Albert Lea, first vice-president; Dr. D. E. Moorhead, Owatonna, second vice-president; and Dr. N. W. Barker, Rochester, secretary.

Dr. Elmer John T. Andersen, who was a member of the Class of 1930 at the University of Minnesota, and whose home was in Minneapolis, was graduated from the University of Louisville School of Medicine in 1934, and is now in practice at Montgomery City, Mo. At the University, Dr. Andersen was a member of the Chi Phi fraternity.

The fall meeting of the Scott-Carver Medical Society and its auxiliary was held at New Prague, Minn., with a dinner at 6:30 o'clock. Dr. Walter H. Ude, Minneapolis, gave a talk on "Modern X-ray Therapy or Treatment," and Dr. E. J. Hueneckens, Minneapolis, presented a paper on "Prevalent Diseases of Children During Winter Months."

More than 200 items made in the occupational therapy department at the Rochester State hospital were made at the Minnesota State Fair. Wee hand-made doll cradles, fitted with cellophane wrapped mattresses and pillows, basket work, doll furniture made from clothespins, hooked rugs, pewter dishes, woven luncheon sets and runners, needlepoint purses and embroidered pieces were included in the display.

Dr. O. J. Hagen, Moorhead, Minn., attended the International Cancer Conference at Madison, Wis., last month. From there he went to the Memorial Cancer Hospital and the Rockefeller Cancer Research Center. On September 18, Dr. Hagen was in Cambridge, Mass., where he represented as President the Governing Boads of State Universities and Allied Institutions on the occasion of Harvard's Ter-Centenary.

Dr. Mabel Ulrich, Minneapolis, a graduate of the Johns Hopkins University School of Medicine at Baltimore, Md., is state director for the WPA writers' project in Minnesota. Dr. Ulrich is not now in active practice. A frequent contributor to *Scribner's Magazine,* Dr. Ulrich for a time operated a book store in Minneapolis. Her husband, Dr. Henry Ludwig Ulrich, is professor of medicine at the University of Minnesota.

Mr. Robert Clayton Lofgren, Starkweather, N. D., a senior student in the University of Minnesota Medical School, has finished his summer work in the Medical School and University Hospital. He will go to the Mayo Clinic at Rochester, for special training in pathology; after which, he will resume study at the University. He is a member of Alpha Kappa Kappa medical fraternity, and Chi Phi social fraternity.

Five Minneapolis and St. Paul hospital heads took a prominent part in three hospital conventions recently held in Cleveland. They were Joseph G. Norby, superintendent of Fairview Hospital, Minneapolis; A. M. Calvin, director of Mounds Park and Midway Hospitals; E. A. Van Steenwyk, executive secretary of the Minnesota Hospital Service Association; Grace V. Johnson, the Dowling school, and Dr. Peter Ward, head of Miller Hospital, St. Paul.

The Minnesota State Medical Association broadcasts weekly at 10:30 o'clock every Tuesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: October 6th, "Women and the Cancer Problem"; October 13th, "Facial Neuralgia"; October 20th, "Dwarfs"; October 27th, "Dental Care in Childhood."

Competitive examinations for the medical corps of the United States Navy are scheduled to be held on December 1, 1936, and the latter part of May or early in June, 1937. There are about 25 vacancies at the present time for the first examination. The age limit is between 25 and 35 years. The nearest examination place in regard to Minnesota, North and South Dakota, and Montana, is the United States Naval Hospital, Great Lakes, Illinois. Information and entry blanks may be secured from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

A special program of lectures and demonstrations in medicine and surgery will be held under the direction of the Mayo Foundation from November 9 to 13, inclusive. Mornings will be devoted to surgical and medical clinics. In the afternoons and evenings symposiums will be conducted on neurology, gynecology, diseases of the ear, nose and throat, laboratory procedures, emergency treatment, pediatrics, and renal diseases. In addition a clinico-pathologic conference will be held. While this program is arranged primarily for the Fellows of the Foundation, visiting physicians are invited to attend.

The North Dakota State Tuberculosis Sanatorium, located at San Haven, N. D. (railway point: Dunseith), is offering its facilities free of cost to physicians who wish X-ray films interpreted, subjects who desire Mantoux tests, and sputum examination. The only conditions are these: (1) X-ray films are read and interpreted free, but return postage must accompany each film; (2) Mantoux tests for children and adults are free, but can be given only on Friday afternoons from 3:00 p. m. to 5:00 p. m., or on Saturday mornings from 9:00 a. m. to 11:00 a. m., all cases being referred here by physicians; (3) X-ray plating is done, but regular fees are charged, which are paid to the secretary-treasurer; or an order from the county commissioner, county auditor, or secretary of the county welfare board, must be presented. The same holds true for sputum negative ambulatory patients whose physicians have requested temporary harborage at San Haven. Such patients may be admitted by certification by their county judge or county auditor; but only after we have shown that we can care for them, and have a bed for them.

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New Series

Athletic Heart—Modern Conceptions and a Recent Investigation*

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Columbus, Ohio

THERE is need for constant, thorough, scientific consideration of the subject of the influence of varying degrees of sport upon various heart types and conditions.

It has been my privilege to investigate various phases of the field in private practice and University Health Service work for seven years. Approximately 500 individual (not entrance examination) cases in this series have been studied with varying degrees of thoroughness and follow up.

Evidence of actual attitudes and conditions in the field is presented by the following series of illustrations.

1. A lady patient recently asked me, "Isn't it true that the hearts of all athletes are enlarged?" Many laymen hold this belief today. I was very quick to assure the lady that according to my investigation this is not the case and, although many phases of the question are still not completely settled, we can definitely state that athletics does not cause heart disease. In some hearts, disease conditions are precipitated or exaggerated but sport does not cause the original disease, as some laymen believe.

2. Some physicians still use the term "athletic heart" to describe a clinical heart picture. A girl age 17 had been told by an elderly physician that her tired feeling was caused by an "athletic heart." He had forbidden her to play tennis. Since she was competing in her school's tournament successfully, this restriction was causing her a great deal of worry and depression. Examination revealed a heart of normal size and function. A blood count revealed a moderate secondary anemia. Reassurance, restoration of her blood picture to relative normalcy, and return to tennis has changed this girl from a depressed, nervous individual with an inferiority complex to a normal, happy school girl.

3. A college boy reported that he had an "athletic heart" and asked recommendation for excuse from all activity, at the request of his mother. He had been a high school pole vaulter. Orthodiagraphic investigation of the heart revealed an area which was a "small normal." Heart function was normal. There was no inferiority factor. In this instance, the boy stated that a *non medical* practitioner, a chiropractor, had taken an X-ray of his heart and told him he had an "enlarged athletic heart." Questioning revealed that the plate had been taken with the tube close to the body and the so-called enlargement designated an "athletic heart."

4. Another patient had been told he had an "athletic heart." Orthodiagram revealed, in this late middle-aged individual, an aorta with a measurement of 9 cm. This was a "non specific" aortitis and aneurysm, instead of an "athletic heart."

5. A young man of middle twenties had been playing competitive basketball on teams in each of two recreation leagues during the same season. He came in because some non medical friends had told him they thought he had "athletic heart." This heart showed slight concentric hypertrophy and his Wassermann reading was 4 plus.

6. A fine high school sprinter discontinued college because of increasing lack of energy, an-

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*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, December 27, 1935.

nouncing to the newspaper that it was because of his heart. Friends said, "Too bad, another athletic heart." Examination revealed a normal heart, except as it might have been influenced by the minimal lesion of adult tuberculosis which was causing his condition.

All too frequently, sport is blamed for hearts which have been inferiority value hearts, entirely apart from sport connection. "Athletic heart" is a much more desirable diagnosis than syphilitic heart or tuberculosis.

These instances are advanced to illustrate the need for continued investigation, more careful diagnosis, and continued public education in the field. In the interest of truth and honest sport, as well as in the interest of individuals their families and physicians, further investigation should proceed. Some advocate a policy of "soft peddling," holding that the question of "athletic heart" is settled and that it should not be continuously reopened, for fear of prejudicing the public against sport. American youth, sport, and all legitimate elements in the picture, will profit by facts and the complete truth, when finally discovered.

Viewpoints Vary Materially

The statement of Doctor L. M. Warfield on the subject in his most recent contribution is, "So many factors enter into the question that it is difficult to arrive at the truth concerning the effect of athletics on the heart."[1] I believe all will agree with this frank, accurate statement.

Doctor Roger I. Lee of Boston said to the National Collegiate Athletic Association in 1916, "The athletic heart when subjected to careful investigation of instruments of precision is usually shown to be a normal heart."[2] Lee's investigation and statement followed the statement of Shumacher and Middleton working in the Student Medical Service of the University of Wisconsin. They published in 1914 a very impressive article concluding that 36 men active in various athletic sports "all showed cardiac hypertrophy."[13] Lee investigated Harvard crew men during the period of their rowing activity in college and drew his entirely opposite conclusions from them.

Doctor Norman Cole of Baltimore, added authoritative statement when he said, "The weight of present opinion seems to be strongly in favor of the view that athletics do not harm the healthy heart. Our conception of what constitutes the diseased heart has changed a good deal in the past few years. Emphasis has shifted from the heart valve to the heart muscle, from heart anatomy to heart function. We do know that valvular defects may be of little import, *that enlargement of the heart may be familial or physiological,* that such signs as faintness and palpitation may be due to an unstable nervous system. These things are not necessarily as we used to think, proof positive of a badly damaged heart. *Our business is to watch for cardiac defects and protect the defective heart.* For the heart that has proven itself healthy, we need have no concern."[3]

Doctor Cole suggests that enlargement of the heart may be physiological. The implication is that it is possible for a normal heart to enlarge physiologically, but if the heart has been proven healthly "we need have no concern."

Sir Thomas Lewis of England states that, "Burdens imposed by physiological acts upon the normal heart, however heavy these burdens, may be said never to injure heart fibers, never produce injurious dilatations, and never exhaust the heart's reserve."

"It is known that an increase in the amount of its work causes hypertrophy of muscle, whether somatic or cardiac. Such hypertrophy does not cause disease, it is physiological. Our evidence points to there being no more than a slight physiological hypertrophy in athletics; there is no real ground for the belief that the heart becomes diseased in its hypertrophy, even in professional marathon runners."[4]

Says Warfield, "I do not believe that any amount of exercise can produce temporary or permanent damage to the normal heart, *with possibly one or two exceptions.*"[1]

It has been found by Deutsch and Kauf[14] that occasionally a heart would become enlarged in young people engaged in many kinds of sport, but that after a period of rest it would return to its former size. This was particularly true of bicycle riders and swimmers.

"Lack of oxygen, even for a brief period, causes the heart to dilate and this is the cause most often operating in dilatation. There is no doubt but that under certain circumstances, other than lack of oxygen, the heart can be permanently dilated and as a result will be less competent than a normal heart."[1]

"We arrive at the working conclusion that no form of athletics, with the possible exception of college rowing, injures the normal heart."[1]

The most recent German communication is that in Artz and Sport. This authority definitely holds that participants in heavy athletics have enlarged hearts. Says this publication: "Athletes who indulge to an extreme in sport have enlarged hearts which are of interest to the physiologist, as well as the physician and pathologist, as indicating the extraordinary adaptive power of the heart to unusual demands. Hugely enlarged hearts in men who participate in sport are, however, extremely rare."

The following classification for hearts of athletes is suggested:

1. A regularly developed normally large heart —the "work heart" which results from athletic activity alone.

2. Acute dilatation of the heart due to reduction of its capacity to contract and manifested by an unpleasant feeling of pressure in the chest.

This is the result of immoderate demands made on an already tired heart and the only condition that should properly be termed "sport heart."

3. The vagus heart—a remarkably large heart which does not hold its shape.

The result of repeated prolonged and heavy physical work which leads to a vagotonic state of the organism. It tends to return to normal when severe exertions cease.

4. Cardiac neurosis which can result from physical as well as from mental and psychic strains. Both parts of the vegetative nervous system are here affected and brought to a high state of excitability. (The essential ideas of 1 and 4 have previously been advanced by Dr. P. D. White.)

There is general pathologic vasolability which improves on regular quiet work.[5]

Tung *et al.* report in the American Heart Journal study of the hearts of Ricksha Pullers. He concludes that, "Chronic exertion in the form of ricksha pulling caused cardiac enlargement in about 45 per cent of the subjects. No demonstrable enlargement was present in the remainder. This cardiac enlargement, probably due chiefly to hypertrophy, is considered to be a physiological response to rapid exertion carried on daily for a period of years. There is no indication that the enlargement constitutes or predisposes to disease.[12]

White notes among myocardial abnormalities:

1. *Hypertrophy due to increased work.*[17]

"Whether increased work and strain alone are primarily responsible, or whether hypertrophy is result of training of the muscle fibers and primary dilation due to strain, (as has been recently suggested) we do not know, but we are aware of the fact that increase in bulk and size of myocardium commonly follows considerable work if long sustained and that it occurs in the part of the heart primarily involved."

"All muscles of heart wall, whether auricular or ventricular (and including papillary muscles) apparently take part in the hypertrophy."[10]

"Cardiac enlargement is occasionally of unknown cause. It is quite possible that there exist causes of enlargement still unrecognized or poorly understood."[18]

One of these conditions is illustrated by the following contribution:

"Myxoedema heart. In an investigation by Dr. Means of Harvard University, 15 of 18 patients studied had enlarged hearts (by cardio thoracic method). Under thyroid therapy, transverse diameter decreased 1.3 to 4.6 cm. Histologically muscle bundles and fibers and connective tissue were widely separated by interstitial edema."[9]

This is a finding of great significance in explaining the obvious changes in cardiac size. Endocrine exhaustion is seen in sport. This is one reason for "burned out" athletes, along with varying degrees of tuberculosis, inactive and active, and cardiac factors.

Doctor Leaman, in a scholarly paper on Heart and Sport, discusses the evidence given by the various studies of lower animals quoting Clark who "shows some striking differences in the heart ratios of active animals and cautions we must be on our guard not to draw conclusions too readily."[8]

Doctor Goss of the Pathology Department of Ohio State University Veterinary School gives me authority for the statement in personal conference that, "Race horses have large hearts and working dogs have large hearts. There is no doubt in my mind that there is such a thing as work hypertrophy in lower animals, but I do not consider it pathological." In answer to a leading question, he stated, "Previous infection or toxemia in these cases is possible but not very probable."

Leaman's contribution constitutes an excellent statement of the subject, whether or not one agrees with his practically complete dismissal of the so-called "athletic heart." His conclusions follow:

1. Heart strain is not possible in a healthy heart. The syndrome now masquerading under that name is an affair of the body as a whole. Strain of the heart in the sense of rupture of its muscle or valves is unproven and not tenable on the experimental evidence at hand.

2. The normal heart does not enlarge in response to athletic activity long continued. The so-called "athletic heart" is a misnomer. When the heart is found enlarged in athletes, it is secondary to a previously existing but unrecognized infection or results from a valvular lesion.

3. Participation in athletics does not predispose to the early development of cardiovascular disease.

4. Detailed cardiovascular examinations should be made of all candidates before participation in activities of various sports. The examination should include an electrocardiogram and fluoroscopy. A follow up system should be instituted after graduation and the records obtained should be kept active as long as possible.

5. The prescription of exercise should depend on the results of this thorough investigation and the functional efficiency of the myocardium should be the guiding beacon.[8]

Apparent agreement is found on the effect of excessive exercise on inferiority value hearts. Says White, "The strain of overwork or excessive exercise, in a person with a heart already damaged, undoubtedly favors the development or increase of enlargement by adding to the work of the heart and the demand for larger output per beat. Race, climate, social status bear only as they effect its causes."[20]

Whether or not athletic enlargement, if it does exist, is other than physiological, or if it constitutes future inferiority factor, is another question.

The enlarged state, whether hypertrophy, dilatation, or a combination, is not considered pathological.[3, 4, 12] White says, "There is no indication that such hypertrophy, when it does occur, is harmful.[7]

"The hypertrophy consists of the increase in size of the individual muscle fibers and apparently not in number."[18] Additional blood vessels are not demonstrated. Theoretically the relative nutrition of the heart muscle may suffer in some degree, although this has not been clinically demonstrated.

In discussing *importance of structural cardiac changes of any degree*, Doctor White seemed to depart radically from old emphases. He stresses structural abnormalities and their importance in an unusual degree.

"We must not lose sight of structural abnormalities which affect often to a very important degree the mechanics and functional state of the circulation. It behooves us to look for structural abnormalities in every cardiac patient, as well as for evidence of functional condition of the circulation.[19] From the preventive medicine standpoint, structural abnormalities which precedes so frequently *in an insidious way*, functional errors would be the more important. When true functional abnormalities exist, pathology is usually well developed."

This seems to be a *tremendously* pertinent observation and greatly strengthens those who are *continuously looking for early significant changes, in order that late changes may be prevented.*

This viewpoint seems to strengthen the preventive medicine attitude in considering "athletic heart."

"It is important to realize that a perfectly healthy hypertrophied heart muscle may dilate and fail with death, even though the muscles show no sign of degeneration."[10]

The heart editor of Year Book of Medicine, Doctor W. D. Stroud, says, "Numerous examinations of marathon runners and other athletes in this country have not shown definite enlargement beyond the physiologic norm, if the hearts were previously normal. Most cardiologists in this country will not admit there is such a thing as an 'athletic heart' or a sport heart."[6]

This attitude is probably guided by the investigation of Marathoners by Gordon Levine and Wilmaers[15] and that on Harvard oarsmen of Lee[2] and probably Leaman's summary.[8] The Wisconsin investigation of Shumacher and Middleton argued for the existence of athletic enlargement. In my opinion, there are not enough published confirmatory specialized examinations, orthodiagrams, and electrocardiograms, and careful "inferiority factor" histories, and adequate follow ups in the American field, to entirely justify any real final conclusion, even yet.

If "physiological hypertrophy" does exist, then there is such a thing as the "athletic heart," as it is commonly interpreted. If it can be proven that a normal heart enlarges, hypertrophies, dilates, or both, under continuous hard usage, such as is found in some types of intensive long continued sport, it will be an illustration of athletic work heart. Existence of such hearts has not been proven as yet in the United States, to the universal satisfaction of the medical profession.

In the development of skeletal muscle, we see some men able to show real increase in size with exercise. Others, particularly the long stringy muscle type, have no success in increasing to a measurable degree their muscle size, regardless of the amount of exercise they take. It is entirely possible that similar conditions obtain in heart muscle.

It is my distinct impression, based on my own investigation, that *some* hearts will enlarge in varying degrees with work, even in the absence of infective or toxemic factors.

Illustrative Cases from a Series 1928-36

I should like to show a very few orthodiagraphic heart figures picked from my series, to illustrate certain points. All of these are anterior posterior orthodiagraphic tracings. The estimation of cardiac size is based on that method known as the cardiac thoracic ratio of Danzer.[16] The series is under review, according to other criteria of heart area.

The whole truth will not be known, until we have adequate oblique tracings and adequate heart volume estimation available. Tracings of this type are illuminating, understandable, suggestive, and a vast improvement in scientific accuracy, over the ordinary prevailing percussion methods in the determination of heart size, except as performed by the most highly skilled.

A great many laymen still think that the heart is shaped as popularly illustrated by the valentine type.

The great variation in heart size is physically illustrated by Heart No. 1, the vertical undersized heart of a tall, thin narrow hipped girl sprinter and No. 2, the enlarged heart of a combination sthenic athletic type Yale football and crew man of the middle 70's. The girl's transverse cardiac diameter is 8.3 cm., while the man's is 18 cm. Age, physical type, and contrast in continuous time of activity experience, as well as a slight inferiority factor in the man athlete are the basis of contrast. An idea of size range in relative normals is conveyed.

The heart (No. 3) of an eastern inter-collegiate pole-vault champion is advanced as strictly normal in area and function, illustrating the generalization that all hearts do not enlarge under the physiologic strain of American inter-collegiate sport. The pole-vault is not a very heavy event but many illustrations in other events and sports are available.

The suggestion of Warfield that "lack of oxygen, even for a brief period, caused the heart to dilate" is a factor that operates, in my belief, in cases of more swimmers and water polo players in American sport than is now ordinarily acknowledged.

The heart (No. 4) of an outstanding girl diver who complained of increasing difficulty in holding her breath under water is advanced in illustration. The heart shows a distinct moderate right heart dilation, in the absence of history of inferiority factor.

Heart No. 5 is distinctly enlarged. It is an illustration of the known and rather obvious expectation that a heart with athletics and subsequent handball imposed on heart muscle with an inferiority factor, did result in enlargement. This heart was advanced as a possible athletic heart by a cardiologist of the Mayo Foundation, who was consulted after the patient was acquainted with my findings.

In addition to the hypertrophy, an A V block of second degree exists. This may be the result of marked hypertrophy or the effects of diphtheria in his history. This man had diphtheria shortly preceding his participation in inter-collegiate football. He played in one college football game for a short time with an attack which at least simulates closely in its history a paroxysmal tachycardia. He has indulged in handball in varying degrees, as the accompaniment of an industrial life during the intervening 30 years. His only complaint at present is a moderate loss of his old extreme physical drive, and a slight shortness of breath. Control tracing of the heart 30 years ago, before the time of his intensive competition, is not available, so the case is only suggestive.

Heart No. 6 is the heart of a college student with distinct enlargement, active rheumatic carditis, and mitral disease.

This case was picked up, after intramural basketball participation which had been indulged without examination. No pre-competitive tracing is available. In light of our general knowledge, there is no doubt that these rheumatic inferiority factors in his heart have been exaggerated by his participation. The only direct evidence is the boy's own testimony of increased heart symptoms, since his competition in high school.

Probable "Athletic Hearts"

The charts of Hearts Nos. 7, 8, 9, 10, and 11 are those of athletes whose hearts are enlarged in varying degrees with no history of any inferiority factor at any time in the picture.

Each case has continued active recreative sport, after his intensive college experience. These hearts are certainly suggestive evidences of the work heart or "athletic heart," as commonly interpreted. There is no existing evidence in any of the hearts or individuals of functional inefficiency or definite proof of any actual or potential heart deficiency. It is probable that all of these hearts would reduce in size, in case exercise were gradually discontinued. Removal of nervous stress and strain (if such were possible) in the cases of the four football coaches, who are included, would also be conducive to return to normalcy. In the absence of tracings, before entrance into sport, no one can say whether or not these are simply illustrations of hearts which inherited a larger size than normal.

In the above instances, I consider this unlikely, as there is nothing in family history to suggest it. There may have been inferiority factors present before or during activity but careful history and examination failed to reveal them.

Heart No. 12 is a very definite illustration of a decrease in heart size following discontinuance of college athletic sport. The boy in question competed in football, basketball, and post-college physical education leadership and handball. The heart was enlarged. It definitely shows a slight increase in heart diameter, immediately after the basketball season in the senior year, as compared to the pre-basketball tracing in his junior year. 15.9 cm. as compared to 15.6 cm. It shows a marked decrease in diameter to 13.8 cm. three years after graduation. Although the history contains no evidence of marked inferiority factor, the history of the fact that at one time a family physician, "thought there was something wrong with his heart" prevents this from being a perfect case for our purpose. It is certainly confirmatory of the heart changes shown in Deutsch and Kauf series. The fact that it is a case in the distinctly American sports of basketball and football, not included in their series, adds to its suggestiveness.

Heart No. 13 is the heart of a world's champion Olympic sprinter. At no time has the heart shown enlargement over the present criteria of normal size. It did show distinct evidence of an enlargement between the time the champion started training for the Olympic games of 1932, as compared to its picture shortly after the games. After about a year of rest from training, its size again decreased. Injury prevented starting of training as early as originally planned. This made necessary relatively intensive training for the games. Diameter 2 - 25 - 30 was 11 cm. Immediately after the games at Los Angeles, the heart showed an increase to 12.5 cm. in diameter and a change from a normal electrocardiogram to one showing a left axis deviation. A year after this examination, the heart had returned to its previous size and the left axis deviation had disappeared. There is no evidence to prove that these changes, very definitely caused, in my opinion, by Olympic participation, have left any inferiority factor in heart function or heart expectancy. Although the heart size was not above normal range immediately after Olympic games, it was in my mind, at that time, an "athletic heart." Although it was not absolutely enlarged, it was relatively enlarged and the only cause discernible, under present criteria, was the heavy athletic participation.

Twenty Year Follow Up of Two Wisconsin Crew Cases

Hearts Nos. 14 and 15 are advanced as 20 year follow ups on cases that were examined in the Shumacher and Middleton series at Wisconsin, 1912-13. Both boys were excluded from crew work at that time, because of enlarged hearts. Twenty years after first examination, the heart of case No. 14 is not enlarged and shows no inferiority factor. It is entirely possible, of course, that the heart was enlarged at that time and came back to normal when taken away from intensive activity. It may have been saved a longer period of enlargement by restriction in exercise.

Heart No. 15 shows an entirely different picture. His heart 20 years after first examination is enlarged and shows electrocardiographically a left axis deviation. His basal metabolism, at the time of my examination in 1933, was —24. This individual has not indulged in active recreative sport in the degree that we can figure may influence heart size since graduation. I believe that this heart inherited a tendency to an exaggerated endocrine picture. The inherited tendency to myxoedemic heart syndrome is possible in this case. Other inferiority factors, outside of a slight recently developed sinus condition, do not enter the picture. I am inclined to believe that this heart was certainly enlarged at the time of the Wisconsin examination but was enlarged in the sense that it was even then a "hypothyroid heart," possibly exaggerated by high school athletic experience. This is purely an opinion. I knew the physical and personal characteristics of the case personally at the time.

The Hearts of the American Olympic Wrestling Team of 1932

Through the courtesy of C. W. Street, American Olympic wrestling commissioner, and Hugo Otopalik, coach, it was my privilege to examine the winners in the American Olympic try outs. The examinations were made approximately 42 hours after the completion of the final elimination tournament competition.

Heart sizes have been variously gauged as to normalcy, but among other criteria of what the heart size should be, height and weight as well as body surface have been considered as having considerable bearing. The outlines of the hearts of the first and second team wrestlers in the same weight class were compared. In general, there was a vastly greater variation in shape and size than we would expect.

The sizes of these boys varied from 128 lbs., height 5 ft. 6½ in. to 208 lbs., height 6 ft. 3 in.

Of the 13 hearts, the next to the smallest in size was that of a boy, weight 164 lbs., 5 ft. 8 in. tall. This boy, a Western Conference champion, gave a history of having taken part intensively in many sports from grade school age. He gave history of having had no disease which might have been considered an inferiority factor in his heart picture. The case illustrates beautifully the fact that in spite of the most intensive high school and college athletic history, and immediately past strenuous competition in the final tournament, this well trained heart did not exceed normal size limits. A contrast is found in another boy on the second team whose heart was larger than that above mentioned, in spite of his lower weight class. This boy gave no history of disease which might have caused an inferiority factor in the heart. In spite of this, his heart shows a distinct enlargement of the eccentric type. The enlargement is primarily of the right heart. This boy had indulged intensive competitive wrestling from a very early age. He was supposed to have "gone back" in relative achievement, after a certain point. Whether this boy's heart was hypertrophied, dilated, or both, is a question, but in the absence of any disease history, this might certainly be an example of an enlarged heart caused primarily by his heavy wrestling activity. The example is again suggestive, because precompetitive tracing was not available.

These findings are open to possible error, in several respects. The wrestler may not have given full history for fear it might interfere with his possible Olympic competition. The need of examining the team in a relatively short time made it impossible to adequately check out the true nature of a relatively narrow aortic shadow which may have had some significance as a slight congenital anomaly. The boy's blood pressure was not taken. The heart is at least highly suggestive as illustrating the combined dilatation hypertrophy which does come to some hearts following intensive competition, in spite of finest Olympic coaching and general handling. No opportunity for follow up studies has afforded itself to determine whether or not his heart returned to normal after Olympic wrestling competition was concluded, as was the case with the Olympic sprinter mentioned elsewhere in this series. It probably did return to normal with few, if any, bad results.

The heart of one first team wrestler was enlarged, but many inferiority factors were present in the history and such enlargement was to be expected, in the light of his history.

Clearly, none of the team members were suffering from any clinical heart weakness. In my judgment, it was only the extreme technical ability of the small boy with the large heart that had carried him through to the final bout.

It is interesting to note the fact that of 13 Olympic hearts, all but two gave history of a previous disease factor which could have been used to explain more enlargements, had they existed.

The facts of this study can certainly be used to illustrate the generalization that all hearts do not enlarge under the strain of intensive competion in American college and Olympic wrestling, even in the presence of previously existing inferiority factors.

Two hearts of 13 in the series were enlarged. Whether or not they have returned to normal size is not proven. Whether or not their enlargement is a source of future heart inferiority is unproven.

Conclusions and Suggestions

1. Some hearts with inferiority factors are now being enlarged pathologically and their inferiority factor increased through participation in sport as now organized and conducted in the United States.

2. An occasional heart without inferiority factor, as now understood, will enlarge under conditions of participation in heavy sports in America. These hearts are definitely mostly athletic or work hearts.

3. In most instances, this increase in size will disappear, in the absence of previous inferiority factor, under conditions of rest, without leaving practical pathological clinical influence.

4. The reason for this varying "physiological enlargement" in occasional hearts will, in my belief, eventually be found to be due to some inherited germ plasm, endocrine, nervous, or biochemical factor, at present not fully understood.

5. The great majority of so-called normal hearts, when well trained, show no change under the heaviest sport.

6. Some hearts with certain past disease history, supposed to predispose to easier pathological cardiac development show no pathologic enlargement after heavy sports experience. In many such cases, proper degree of activity is clinically beneficial, instead of detrimental to the best interests of the heart and the entire organism.

7. Inadequate recognition is given the condition known as potential heart disease in some cases involving the question of participation in athletics. The question of what constitutes an inferiority factor of degree which is a danger in future athletic participation is not settled.

8. The tremendous variation in so-called normal hearts should be subject of continuous study in various age groups.

9. The fact that opportunity for specialized cardiac examinations with instruments of precision is practically available to a minority only, handicaps rapid progress in this field of investigation.

10. Because of the willingness to say, "There is nothing in this athletic heart business, your heart's all right," other conditions which are criteria of the degree of activity individuals should indulge are many times overlooked in sports examinations. I have in mind such conditions as silent pericarditis, or silent endocarditis, varying degrees of mediastinal distortion, small degrees of pleuro pericarditis, tuberculosis, and others.

11. I suggest that, while the term "athletic heart" is in a sense "unfortunate, misleading, and a misnomer," that it might well be maintained and combined for health education purpose with the true diagnosis of the heart condition. This seems fair, in cases where sports participation has contributed to the degree of abnormal cardiac condition present. Such a conception might bring into our terminology such terms as rheumatic athletic heart, athletic hypertensive heart, pulmonary athletic heart, anoxemic athletic dilatation, probably transitory athletic enlargement, etc.

12. In my mind, a fine public health contribution, in the field of the influence of sport on the heart can be made by a closely co-ordinated program of student health services with college, high school, and other physical education administrators. Interest of medical, health and educational organization officials and physicians in full cooperation is necessary.

13. Scientific investigations made in the United States, in the field of the influence of sport on the heart, are not conclusive but are very interesting and suggestive.

I have studied the field for 34 years in varying personal and "educationally professional" capacities. My feeling is that science cannot generalize accurately on evidence of results in any one given sport.

Tremendous variation exists in competitor types, ages, nationality, intensity, training, coaching personalities and methods. Climate, temperature, elevation, diet, personal habits, inferiority or superiority factors all enter the picture.

We still have a broad and fertile field for properly conducted and followed up investigation of the influences of American sports on the heart.

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Cancer of the Skin*

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CANCER of the skin occupies a distinctive position in a study of cancer because the changes which sometimes precede the actual cancerous lesion and the pathogenesis of the growth can be followed through its incipient stage to the fully developed tumor. Although it is true that cutaneous cancer is not as important as certain groups of internal malignancies, nevertheless, the subject warrants much attention.

Practically, it is sufficient if we designate as precancerous all those pathological changes in the skin and mucous membranes which potentially become cancerous; that is, those which if left alone will, in a large but not yet exactly fixed percentage, sooner or later turn into actual cancer.

In the most important cases of precancerous dermatoses, great importance can be ascribed to long-continued external irritation, but too great importance must not be laid to this cause alone, for an irritant does not affect all individuals in the same way. The cancer following chronic roentgen dermatitis is a good example of alterations produced by an external agent which may go on to cancer, while the cancers occurring in xeroderma pigmentosum are examples of a constitutional disposition of the epidermis which is easily and quite positively so affected by sunlight as eventually to show malignant changes.

The various keratoses occurring on the face and hands are often the preceding lesion of a subsequent cancer in a certain type of keratosis. In this type the cells of the region possess a specific proliferative power which, when stimulated, go on to cancer, while another type remains throughout the life history as mere keratosis. Removal of all keratoses, however, is to be recommended as a prophylactic measure.

What determines the type of cancer that a potentially cancerous lesion will produce is not known. From a clinical-statistical study it has been pretty well established what to expect, but there is no certainty.

It is not my purpose in this article completely to review this important subject, but certain practical points will be discussed.

Age of the Patient: In our experience, the cutaneous cancers occurring between the ages of fifty and sixty-five constitute the most important age group. It must be mentioned here that age alone is not a good point against the diagnosis of cancer. Basal-celled growths are often seen in the thirties and even earlier, while the more serious squamous types are occasionally encountered in the very young. Cancers occurring in the aged (seventy-five to eighty-five) as a rule are slower of growth, and because of the patient's short life expectancy may be dealt with more conservatively.

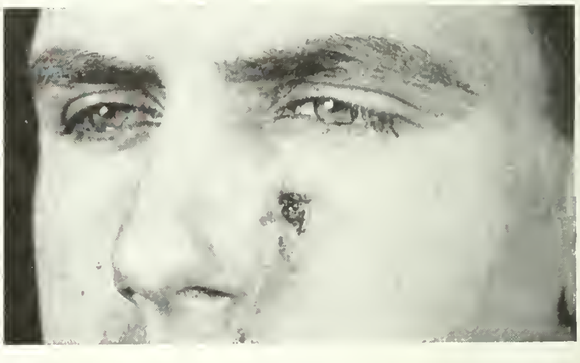

FIGURE 1
This patient illustrates that squamous-celled cancer may occur in the young. Age of patient, 23.

Type of Lesion: A good working rule is that the smaller the lesion, the easier it is to cure, but this does not apply to malignant melanomas which are not included here. Because pedunculated and elevated lesions are handled with greater ease than

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*Read before the Hennepin County Medical Society, March 25, 1936.

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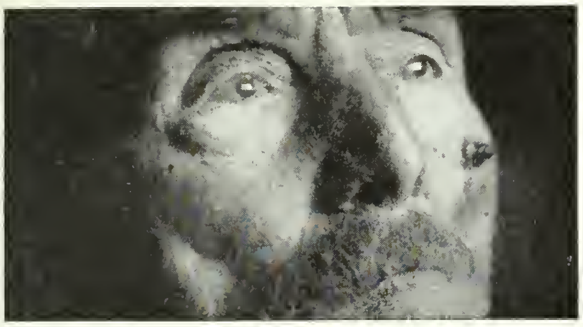

FIGURE 2
Picture illustrating the fact that a cancer may be small and present for a long time and still be a squamous-celled cancer.

ulcerating and infiltrating lesions, it may be said that the prognosis is better in a pedunculated than in a sessile tumor.

Anatomic Location: The precise location of a tumor is of great importance. Lesions overlying or penetrating bone or cartilage constitute a serious problem. Lesions so located that their destruction alters function are also difficult to handle (those of the canthi, for example). And, of course, lesions which grow into inaccessible cavities, such as the auditory canal or the nasal cavity, make treatment more difficult.

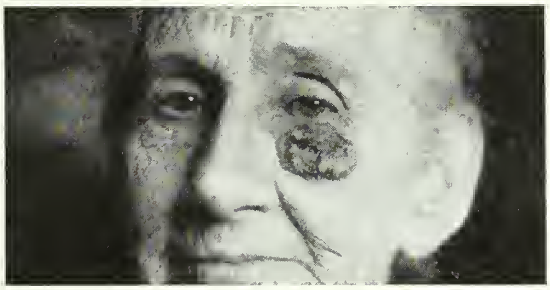

FIGURE 3
Patient showing rather extensive fungating type of squamous-celled epithelioma which offers a serious problem in treatment because of its wide base.

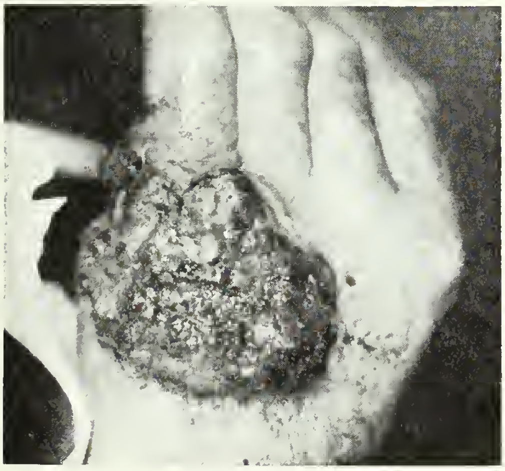

FIGURE 4
Cancers of the dorsum of the hand are usually squamous-celled and of a serious prognosis.

Rate of Growth: The faster a lesion grows, as a rule, the more malignant it is, but slow growth by no means insures that it is a benign skin cancer. We have many times seen squamous-celled lesions that were very slow in evolving.

Biopsy: It is our contention that therapy in cancer must depend in part upon the microscopic picture. We are convinced that a properly taken biopsy does not jeopardize the patient nor alter the prognosis. Even if there were a slight risk, the advantage gained is worth the risk. From a therapeutic angle only the basal and squamous-

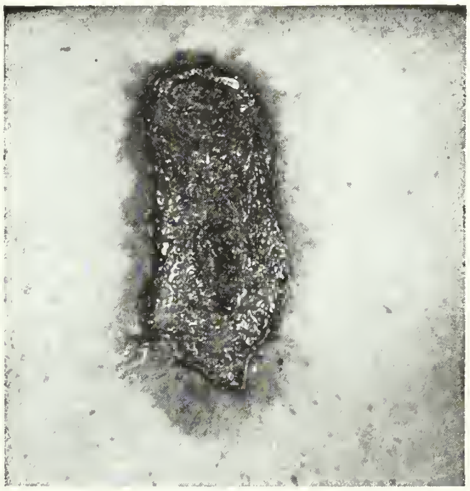

FIGURE 5
Cancers often originate in chronic scars such as following burns and roentgen dermatitis. They are almost always squamous-celled in type.

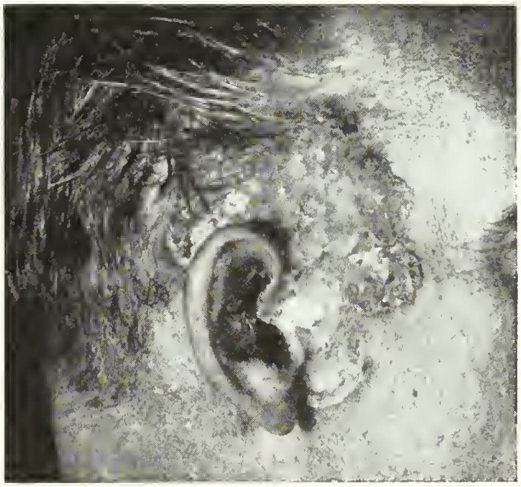

FIGURE 6
Morphoea type of basal-celled epithelioma. This type of cancer is not very malignant in itself, but because of its tendency to continue to spread peripherally offers quite a problem in treatment.

celled growths need be considered. The mixed type should be classified with the squamous because of its radiant-resisting qualities.

Treatment: No one type of treatment can be recommended in skin cancer. It is highly important, in fact imperative, that a procedure be indicated definitely before it is undertaken. Also, one must never expect more of a method than it is reasonable to expect (such as inadequate radium treatment to a squamous-celled growth, or irradiation to the surface of an infiltrating growth, *etc.*

Radiation, surgery, and destructive electrical methods all have their places in treating cutaneous cancer, and the choice of treatment or combination of treatments, together with the experience of the operator must be carefully considered before advocating any specific method.

Active Pulmonary Tuberculosis in Students at the University of Michigan*

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THE problems of tuberculosis in college students have been recently reviewed by Long[1], Shepard[2], Ferguson[3] and Stiehm[4]. These reports indicate that 10 per cent of college students in the rural West and 50 per cent of those in the more populous eastern states have positive tuberculin tests. The best present data indicate a rate of about six active cases per 1,000 students in the college population as a whole.

Other reports have come from the pioneer work of Myers at the University of Minnesota, from Soper at Yale University, and others. The peculiar obligation of colleges to their students, the frequency of delayed recognition of the obligation, and the ineffectiveness of many present college programs in tuberculosis control, have been pointed out. At Michigan the attitude of the student health service toward tuberculosis during the past 20 years has been in keeping with developments in the knowledge of this disease, but it has been limited by the demands of other problems.

Practice in this clinic was guided in 1913 by the idea that tuberculosis was a contagion always detectable in early stages by a very exact and prolonged use of the stethoscope. The later idea that the disease was universal and not to be taken so seriously doubtless influenced an eminent internist in advising that tuberculin testing of students was useless.

The development of the X-ray in chest examination resulted in the gradual extension of its use in our clinic work, until last year 25 per cent of the men and 41 per cent of the women on the campus had an X-ray examination of their chests. From the first, all entering new students have been given a health examination, including history. Each year this is improved. Tuberculin testing has been done for freshmen women during the last four years. Following or during the entrance examination, chest X-ray examinations have been made on selected cases in increasing numbers. For several years it has been done as a routine for foreign student entrants, Negroes, and students from the insular possessions of the United States. During the last school year 22 per cent of the freshmen men and 90 per cent of the freshmen women received X-ray examinations of their chests.

This fall the Department of Roentgenology of the University Hospital made, during registration week, a single film examination of all new students. A single X-ray unit made 700 film exposures in one eight-hour day. This was done more or less as an experiment, and is to be evaluated later.

Table No. 1 gives the rates, by sex, of active pulmonary tuberculosis, with diagnosis confirmed by X-ray, for all students during the past 16 regular session years. It also gives the rate of frequency of X-ray examination of the chest in each year since 1928-29. The uniform rate of active pulmonary tuberculosis of about two per 1,000 student population, in spite of the general decline of the disease in the population at large, is explained by the greater care employed and the improved methods of case finding. The average rate for the sexes is the same, in spite of the fact that for the past four years all of the freshmen girls have been tuberculin tested and all positive reactors given X-ray examination, whereas only about 22 per cent of the entering men, selected on the basis of history or physical examination, have received X-ray examination.

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*University Health Service.

TABLE NO. 1

TUBERCULOSIS AND CHEST X-RAYS

University of Michigan Health Service. Regular Sessions.

Active Pulmonary Tuberculosis—First Year Diagnosed. All Students.

	Number					Rates Per 1,000 Population				
	Chest X-Rays		Active Cases			Chest X-Rays		Active Cases		
School Year—	Women	Men	Women	Men	Both	Women	Men	Women	Men	Both
1919-20	...	...	1	12	13	...	...	0.5	2.2	1.8
1920-21	...	...	0	17	17	...	...	0	2.8	2.1
1921-22	...	...	0	18	18	...	...	0	3.0	2.2
1922-23	...	...	3	11	14	...	...	1.4	1.7	1.7
1923-24	...	...	5	12	17	...	...	2.2	2.0	2.1
1924-25	...	...	4	7	11	...	...	1.6	1.2	1.3
1925-26	...	...	4	4	8	...	...	1.9	0.6	0.9
1926-27	...	...	5	9	14	...	...	2.3	1.3	1.6
1927-28	...	...	7	9	16	...	...	3.0	1.4	1.8
1928-29	328	326	13	10	23	155	51	6.1	1.6	2.7
1929-30	345	600	7	15	22	155	91	3.2	2.3	2.5
1930-31	447	749	3	12	15	200	118	1.3	1.9	1.7
1931-32	629	1427	7	18	25	296	235	3.3	3.0	3.0
1932-33	685	1266	6	12	18	350	227	3.1	2.2	2.4
1933-34	603	1281	1	13	14	305	240	0.5	2.4	1.9
1934-35	892	1448	1	11	12	408	245	0.4	1.9	1.5
Totals	...	...	67	190	257	...	...	1.95	1.95	1.95

A study of the stages at which the disease has been diagnosed during the past five years, Table No. 2, reveals that 62 per cent of the cases have been minimal, 30+ per cent moderately advanced, and 8 per cent far advanced. It is interesting to note that this year, with X-ray examination of all entrants, 46 per cent of cases are minimal, 46 per cent moderately advanced, and 6+ per cent far advanced. Somehow this tends to reassure us that the previous method of case finding did not miss very many more early cases than will be missed by any method short of annual tuberculin testing or X-ray examination of all students.

TABLE NO. 2

PULMONARY TUBERCULOSIS IN UNIVERSITY STUDENTS AND APPLICANTS FOR ADMISSION, 1930-1935

Stage at Which Disease Was Diagnosed

Years, Including Summer Session*	Minimal				Moderately Advanced				Far Advanced				Total Cases
	Men	Women	Both	%	Men	Women	Both	%	Men	Women	Both	%	
1930-31	7	3	10	50	5	1	6	30	4	0	4	20	20
1931-32	13	6	19	70	4	2	6	22+	1	1	2	7+	27
1932-33	8	6	14	66	5	2	7	33	0	0	0	0	21
1933-34	9	1	10	58	5	2	7	41+	0	0	0	0	17
1934-35	8	1	9	60	2	2	4	26	1	1	2	13+	15
Total for Period 1930-35	45	17	62	62	21	9	30	30	6	2	8	8	100

*Summer Session students are not examined at entrance, but a relatively large number of cases are detected for them in the clinic.

Incidence by Departments

The records of discovered active cases by university departments over a period of 18 years are presented in Table No. 3. The increased average rate for medical and graduate students may be explained in part upon the basis of age, and in part by the large number of Chinese students in the graduate school.

At several times in the past all medical students have had routine chest X-ray examinations. In 1931-32 a survey of the whole department gave X-ray findings of activity at the rate of 4 per 1,000.

Active Tuberculosis by Classes

The question of disease incidence by classes and years of residence in the University was studied briefly. When all factors were considered the differences did not seem significant. About one-half of our students are transfers. In this group and in the freshman class, the disease rate is higher because of detection at entrance.

Incidence in Foreign Students

The frequency of tuberculosis at Michigan in students from foreign countries demanded attention and a study* was made of the relative frequency in this group, particularly in students from China. In Table No. 4 the average rate among foreign students for the past eight years is shown as almost 17 per 1,000. The rate for all students, including those from overseas, is 2. Table No. 5 gives an analysis of four years' records in more detail, including costs of care in the two groups. Costs per foreign patient were double that of the all-patient average, and costs for the foreign group thus became sixteen times as much as for all students.

TABLE NO. 3

ACTIVE PULMONARY TUBERCULOSIS BY UNIVERSITY DEPARTMENTS

Regular Sessions Combined Averages

Year	Item	Department							
		Lit.	Eng.	Med.	Law	Dent.	Grad.	Others	Total
1917-18 to	Enrollment	74,892	26,401	8,388	7,172	4,937	9,305	9,745	140,840
1934-35	Cases	126	60	28	14	10	30	5	273
(inclusive)	Rate per 1,000	1.68	2.27	3.34	1.95	2.02	3.22	....	1.94

TABLE NO. 4
FOREIGN STUDENT RATES PER 1,000. FIRST DIAGNOSIS
Both Sessions

Year	Population	Cases	Rate
1928-29	232	4	17.2
1929-30	251	2	7.9
1930-31	281	2	7.1
1931-32	256	8	31.2
1932-33	210	5	23.8
1933-34	195	2	10.2
1934-35	218	1	4.5
1935-36 (to Nov.)	220**	7	32.
Eight years	1,863	31	16.6

*Fopeano, "Tuberculosis in University Students of Foreign Birth." Proceed. 13th Annual Meeting Uni. Student Health Assoc., Dec., 1932.

**Estimated.

TABLE NO. 5
SUMMARY COMPARATIVE HEALTH SERVICE COSTS OF HOSPITAL CARE OF FOREIGN STUDENTS
BOTH SESSION ADMISSIONS

Year	Student Group	All Illnesses					All Illness Except Tuberculosis					Tuberculosis Only				
		Rates per 1000 Population			Rates per Patient		Rates per 1000 Population			Rates per Patient		Rates per 1000 Population			Rates per Patient	
		Patients	Days	Expense	Days	Expense	Patients	Days	Expense	Days	Expense	Patients	Days	Expense	Days	Expense
1928-29	All groups..	117	705	$3,861	6.00	$32.78	115	635	$3,534	5.50	$30.59	1.9	70.2	$ 326	35.20	$163.65
	Foreign.....	168	2,194	11,760	13.05	69.96	150	1,009	6,652	6.68	44.09	17.2	1,185.3	5,108	68.75	296.26
1929-30	All groups...	104	578	2,560	5.52	24.47	102	523	2,336	5.09	22.74	1.9	55.1	224	28.83	117.09
	Foreign.....	67	1,390	5,963	20.53	88.05	59	338	1,477	5.66	24.72	7.9	1,051.8	4,486	132.00	1,126.00
1930-31	All groups..	116	687	2,891	5.88	24.78	114	650	2,754	5.68	24.07	2.2	36.2	137	16.10	60.86
	Foreign.....	92	1,259	5,558	13.61	60.07	85	939	4,357	11.00	51.01	7.1	320.2	1,201	45.00	168.75
1931-32	All groups..	136	718	2,923	5.28	21.51	134	689	2,814	5.13	20.95	1.6	28.1	110	16.20	68.92
	Foreign.....	160	2,191	9,157	13.68	57.17	128	1,453	6,414	11.27	49.76	31.2	738.6	2,743	23.62	87.77
Four-Year Average																
	All groups.........	118	671	$3,050	5.65	$25.69	117	624	$2,853	5.35	$24.43	1.9	47.2	$ 198	24.39	$102.29
	Foreign..........	120	1,738	7,971	14.41	66.10	104	936	4,686	8.92	44.68	15.6	801.9	3,285	51.12	209.42

An Analysis of Active Cases Among Entrants

Table No. 6 shows the previous college experience of our cases. From these averages it appears that women entrants have slightly more tuberculosis, but the comparison by years makes its significance doubtful. The difference between freshmen and transfers is probably not significant, but the greater amount of tuberculosis among new students entering the graduate school is evident. This may be entirely because of the large amount of the disease among Chinese, most of whom are graduates.

TABLE NO. 6
ACTIVE PULMONARY TUBERCULOSIS IN ENTRANTS ACCORDING TO PREVIOUS COLLEGE EXPERIENCE
Fall Entrants. Rates Per 1000

	Entrants					
	Examined		Active Cases			
	Men	Women	Men		Women	
Years—			No.	Rate.	No.	Rate.
1928-35 Inc. Freshmen..	8,339	3,124	15	1.8	8	2.5
1931-35—						
Transfers from colleges	3,584	1,842	4	1.1	6	3.2
Graduates and Medical	1,362	529	18	13.	2	3.8
1928-30 Inc. Transfers, Graduates and Medical	2,581	1,569	11	4.	8	5.1

Comparison of the Results of Different Methods of Case Finding

Table No. 7 gives the result of two different methods of case finding. For the past three years entering men have been selected for X-ray examination by means of careful attention to history and physical examination. In addition, all foreign students, Negro students and those from insular possessions have been selected for X-ray examination. During this same period all entering women have been tuberculin tested and those reacting positively were selected for X-ray examination.

A comparison of the results shows no consistent difference in the rate at which cases were found. Twenty-five per cent of the freshmen men and about 60 per cent of the women received X-ray examinations during each of these three years. Few cases were first detected later than the first month after admission to the University.

TABLE NO. 7
ACTIVE PULMONARY TUBERCULOSIS
Case Finding by Selection—Fall Entrants
Active Case Rate per 1,000—Cumulative

	Men		Women		Both	
	Number	Rate	Number	Rate	Number	Rate
A. Three Years, 1932-33-34—						
a. Entrants	5735		2474		8209	
b. Found within one month	13	2.3	5	2.0	18	2.2
c. Found within five months	15	2.6	5	2.0	20	2.4
d. Found within eight months	15	2.6	5	2.0	20	2.4
B. 1932—						
a. Entrants	1679		755		2434	
b. Found within one month	4	2.4	3	4.0	7	2.9
c. Found within five months	4	2.4	3	4.0	7	2.9
d. Found within eight months	4	2.4	3	4.0	7	2.9
C. 1933—						
a. Entrants	1827		819		2646	
b. Found within one month	3	1.6	1	1.2	4	1.5
c. Found within five months	3	1.6	1	1.2	4	1.5
d. Found within eight months	3	1.6	1	1.2	4	1.5
D. 1934—						
a. Entrants	2229		900		3129	
b. Found within one month	6	2.7	1	1.1	7	2.2
c. Found within five months	8	.3.6	1	1.1	9	2.9
d. Found within eight months	8	3.6	1	1.1	9	2.9

Table No. 8 shows 22 cases by years of college residence before a diagnosis was made, and for whom the entrance history and examination were negative. This group constitutes all of such known cases and is 23 per cent of all cases diagnosed in men during the six-year period studied. They were either missed by our method of case finding or developed the disease after admission.

As a matter of fact other cases have been missed—not because the suggestive history and physical signs were absent—but because the system of follow-up does not function perfectly.

TABLE NO. 8

Case recognition during past six years in men who on entrance had negative history and negative physical examinations.

Residence Before Recognition—	Number.
1 year or less	4
From 1 to 2 years	7
From 2 to 3 years	4
From 4 to 5 years	5
Over 5 years	2
	22

Table No. 9 gives the preliminary results of the use of a routine single film on all entrants during the present year examination. This indicates an active disease rate of about 5 per 1,000, and including healed cases a rate of 13 per 1,000.

An inspection of the entrance examination blanks of those men discovered by the survey to have active disease, reveals that every case but one would have been selected for X-ray examination on the basis of selection employed in previous years. The one case was a patient who knew he had had childhood tuberculosis but failed to answer truthfully the question in the blank referring to this.

TABLE NO. 9

PRELIMINARY READINGS OF A RAPID CHEST X-RAY SURVEY OF INTRATHORACIC TUBERCULOSIS ON 3,300 STUDENT ENTRANTS

Rates Are per 1,000—Fall, 1935

Items	Men		Women	
	No.	Rate	No.	Rate
Number examined	2254		1043	
1. Gohn's tubercle	115	51	58	55
2. Calcification, parenchymal, other than Gohn's	27	12	6	6
3. Pleural calcification	0		0	
4. Hilar calcification	138	62	56	53
5. Hilar and mediastinal glands, T. B. non-calcified	2	1	0	0
6. Parenchymal infiltration	18	8	7	7
7. Cavity	1		1	
8. Except as above (not calcified parenchymal scar)	1		1	
Total	300	133	129	123

Aside from other incidental advantages to the student and to our over-crowded clinic, the value of the routine X-ray as a case finding device needs further evaluation in comparison with our previous method of selection. The present evaluation based upon cases found does not clearly justify the expense. Taking everything into consideration, however, a complete year's experience may justify our repeating the experiment.

Questionnaire Study

In 1931 a follow-up study was made of 185 active cases diagnosed in the department during the previous 12-year period. Twenty-five deaths, 13 known to be of tuberculosis, had occurred at that time.

A questionnaire to 171 persons brought 83 replies which, upon analysis, showed 51 per cent to have had sanatorium care for an average period of one year per patient. Sixty-five per cent reported complete recovery and 27 per cent reported partial healing.

Chest X-rays in a Student Clinical Service

The rise of the importance of roentgenology in diagnosis is well understood by the clinician. The frequency with which it will be used for tuberculosis case finding when immediately available, without patient expense, in a student clinic, is indicated by the date for recent years in Table No. 10. It was used increasingly during the previous ten-year period.

TABLE NO. 10

CHEST X-RAY EXAMINATIONS IN A STUDENT CLINIC

1928-29 to 1934-35

Rates per 1,000 population (90 Per Cent Clinic Patients)

Examination Rates

School Year	Freshmen		All Others		All Students	
	Women	Men	Women	Men	Women	Men
1928-29	158	86	155	45	143	46
1929-30	194	110	148	87	155	91
1930-31	225	114	195	119	200	118
1931-32	363	272	281	228	296	235
1932-33	580	243	301	224	350	227
1933-34	542	239	246	240	305	240
1934-35	898	213	288	253	408	245

Conclusions from the Study of Tuberculosis Among Students at the University of Michigan

1. There has been a constant rate of 2 per 1,000 of active pulmonary tuberculosis cases among students during the past 20 years. The rate has remained constant in spite of the increasing use of diagnostic procedures, probably because of the decrease in the disease in the population at large.

2. For the past three years the incidence of recognized disease in men and women has remained the same, although in the case of women the method of case finding employed consisted of tuberculin testing of all entering women and X-ray examination of the positive reactors, while in the men the method employed was careful history, physical examination, and X-ray examination of all suspects including all foreign students and all negroes.

3. During the past five years 62 per cent of the discovered cases of tuberculosis in all students has been minimal, 30 per cent moderately advanced, and 8 per cent far advanced.

4. Analysis of the distribution of cases as to citizenship reveals that tuberculosis is found 8 times as frequently in students of foreign birth as it is in the student population at large.

5. Analysis of the distribution of cases as to classes, years of residence in Ann Arbor, and as to departments reveals, as the only significant findings, first, that the rate in the Graduate School and in the Medical School is considerably higher than is found in the student population at large; and secondly, that this increased rate is probably to be explained by the fact that these students are older than the average age in other departments, and further by the fact that the proportion of foreign students in these departments is relatively large.

6. The use of X-ray examination of the chest of 100 per cent of the entering students this year (1935-36) has uncovered only one case which could not have been suspected on the basis of foreign residence, colored race, history of contact, or suspicious history or physical examination.

7. The program for the detection of tuberculosis in students after the first year of residence, which consists at the present time of the provision of readily available medical service, with free X-ray facilities and general measures of health education, detects each year about five cases (0.6 per 1,000) in students who gave no suspicious history or physical signs at the time of entrance.

8. It must be emphasized that these conclusions are based upon experience with a highly selected intelligent group which is in general co-operative and able to observe and give histories which are more reliable than those obtained under most circumstances in general population groups.

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Memorial Tribute to Dr. E. Starr Judd[*]

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THROUGH the munificence of a friend of education and of this University, we of this medical community are privileged again to hear from one who has contributed much to the advance of surgery. This happy occasion is saddened by the absence of our benefactor from our midst. Last November thirtieth, the startling and distressing news went around the world that Dr. Edward Starr Judd, at fifty-seven, had died of pneumonia. And so was brought to an abrupt ending a life rich in accomplishment. His passing caused all who knew him well the anguish of an acute heartache in the realization that an idol had fallen. To colleagues everywhere the death of Dr. Judd brought a profound sense of the loss of one of the world's great surgeons.

Dr. E. Starr Judd, known to his friends as Starr, was born in Rochester, July 11, 1878. His father, Edward Francis Judd, had come west from Connecticut in quest of a more healthful climate. Here he met and married Emma Jane Meyers. Four children, two sons and two daughters, were born to this union. The daughters died in infancy and the father did not long out-live them. To the mother, affectionately known to the community as "Little Juddy" fell the responsibility of rearing the two boys, Starr and Cornelius. How well she did this is known to every one privileged to know Starr Judd.

Starr was educated in the public schools of Rochester, Minnesota, and was graduated in medicine at this University in 1902, whereupon he returned to his native city of Rochester to do his hospital apprenticeship. Here his remarkable dexterity, skill, and superior ability caught the attention of the staff of the Mayo Clinic, and in 1904, at the age of twenty-six, Dr. Judd became a member of the surgical staff of that institution. To have attained to an abundant opportunity for which most men wait and struggle for many years longer might have proved a dangerous privilege. But for him, it was an incentive to prove himself worthy of the trust. Then began thirty-one years of unceasing labor and service.

In 1908, Dr. Judd was married to Helen Berkman of Rochester. Five children, two sons, both of whom are students of medicine, and three daughters, together with Mrs. Judd, survive their illustrious father and husband.

Time does not permit of recounting here Dr. Judd's many achievements. At the time of his death, he was Chief of the Surgical Staff of the Mayo Clinic and Professor of Surgery in the Mayo Foundation and the Graduate School of the University of Minnesota. During the period of participation of the United States in the World War, he was commissioned Major and Director of the United States Army School of Anesthesia and Surgery at Rochester. In 1922, he was made Lieutenant Colonel in the Medical Reserve Corps, the functions of which office he discharged up until retirement in 1927. He took keen interest in the activities and programs of the numerous local and national surgical organizations to which he belonged. His colleagues recognized his unusual qualities of leadership and heaped responsibilities upon him and rewarded him with honors. In 1932, Dr. Judd was President of the American Medical Association. Surgical societies here and abroad elected him to honorary membership; but honors were regarded lightly by Dr. Judd, who retained a sincere simplicity while enjoying a proud position amongst medical men.

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[*] Read on the occasion of the Third Annual E. Starr Judd Lectureship in Surgery at the University of Minnesota, March 17, 1936.

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In the operating room, Dr. Judd was at his best. Here he had few equals. Surgeons came from far to see him work. The quiet and easy manner in which he operated rarely failed to arrest attention. The movements of his hands were graceful and direct and without flourish. There was no ostentation or striving for effect, no suggestion of hurrying, but the dispatch with which he completed difficult operations was proverbial. One could not spend a morning in the operating room at his side and escape the impression that here was a master surgeon endowed with the natural talent of a great artist—something that is not to be acquired by training alone. That remarkable artistic skill, moreover, was tempered by the serene wisdom of a large experience, a superior understanding and matchless judgment. Little wonder that Dr. Judd was said to have been the greatest technical surgeon of his time!

His publications, many of which were written in collaboration with helpful colleagues, number 327 and cover a wide range of subjects in surgery. His principal interests related to abdominal and urologic surgery, in which fields he made several important contributions to surgical knowledge. Through virtue of the eminent position which he occupied in American Surgery, and the high esteem in which he was held by his fellows, Dr. Judd was much in demand as a lecturer before medical audiences. Through the medium of the spoken and written word, his practices in surgery became known to physicians the world over. He had an eager and ardent interest in the training of surgeons and left his stamp upon many surgical aspirants privileged to work with him. Dr. Judd recognized the superiority of the experimental method in advancing medicine and instilled in many a young man an anxious desire to contribute to the patrimony of medical knowledge. By the precept of example he taught young men the love of hard work, always exacting from himself the same standard of effort which he expected from his assistants. If, as we have been told, "every man shall be rewarded according to his works," Dr. Judd's recompense in life must have been great for he found abundant satisfaction and pleasure in the knowledge of work well done. Great earnestness, a lofty purpose, and a kindly sympathetic understanding characterized his every undertaking—wonderful attributes for a teacher whose influence may determine in large measure the objective of plastic and ambitious pupils.

And so, at the height of his activity, Dr. Judd died as he had lived. The image of a modest, earnest, and kindly man lingers with us and remains indelibly engraved upon the memories of all who knew him. May his spirt and ideals long abide with us! In thousands of homes where his ministrations brought relief from suffering and restored health his name will be cherished in grateful remembrance. Colleagues everywhere mourn the passing of a surgical master, a great teacher, wise counsellor, and true friend.

On this occasion our sympathy goes out to his family whose loss is greatest. May they be sustained by the memory of a noble and useful life. And when, from year to year, we gather to hear of exploits in surgery under the auspices of the E. Starr Judd Lectureship, through the generosity of our charitable and public-spirited donor, let us resign ourselves to the piety of memory, renew acquaintance with his ideals, and reflect for a moment upon the glory of this great and good man. We need the example of men like Dr. Judd more than they need our praise.

A New Treatment for Baldness

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Theory

THAT the now commonly used vacuum and pressure therapy in vascular diseases of the extremities[1] would be of value in the treatment of the alopecias was conceived by the author, while a resident of the Cincinnati General Hospital, where it was frequently noted that senile patients undergoing treatment for vascular diseases, developed hair not present for quite a number of years, on the extremity treated.[2]

Studies of the scalp were begun and revealed the following:

1. That senile and premature types of alopecia always develop at the areas furthest from the origin of vascular supply or where the supply is most meager, and always removed the musculature

(occipital and temporal) which may have a passive massaging or pumping effect on the vessels present. One needs only to compare the areas where alopecia develops with the vascular supply of the scalp, to feel definite relationships exist.

2. The vascular supply of the scalp is derived from (a) two occipital arteries which emerge from the deep tissues of the neck at the nuchal notch; (b) two superficial temporal arteries, branches of the external carotid; (c) frontal and supraorbital branches of the internal carotid. From the larger arteries lying along the musculature of the frontal, temporal, and occipital regions of the scalp and padded by the subcutaneous tissue, branches penetrate the pars reticula of the derma where they anastamose to form a *deep cutaneous net-work;* it is from this deep anastamosing net-work that the papillae of the hair follicles derive their vascular supply. The deep cutaneous net-work gives off branches which travel outward, penetrating the reticular and papillary portions of the scalp to form a second anastamosing net-work lying just beneath the skin papillae, *the papillary and sub-papillary net-work.*[3] This is considered a very important anatomical fact by the author as it gives the blood supply of the scalp a means of shunting from the larger vessels to the papillary and sub-papillary network and into the venous bed without circulating freely through the deep cutaneous net-work, should the latter be obstructed or impaired in any manner.

3. Young and Love, in a series of dermal punches of the scalp in patients suffering with the different types of alopecias, found sclerosing of the deep cutaneous net-work varying from mild sclerosis to complete obliteration of the vessels in relationship to the degree of baldness in the senile and premature types of alopecia. They were also capable of demonstrating atrophy of the medullary portion of the hair follicle in relationship to the degree of sclerosis of the deep cutaneous network of vessels. They will use this means to prognosticate the efficacy of vascular treatment in the series which they are to run.[4]

4. B. L. Dorsey, after extensive dissection, craniometry and clinical research, recently found that alopecia is more frequent in men with a wide temporal diameter and found that in such patients a definite constriction of the temporal artery and a dilatation of the temporal veins existed above the level of the hat band. His obvious conclusion was that alopecia prematura and senilis are primarily vascular deficiency diseases.[5]

5. Grinde and Nosik, trying a modification of this type of treatment, report a distinct improvement in the vascular supply of the scalp.[6]

6. The skin is the visible index of the aging process. The derma proper in middle age or late life, according to racial or familial tendencies, becomes atrophic (due, we believe, to a diminution of blood supply.) The process is evidenced by the destruction of fibro-elastic elements, so that the smooth elastic covering, which formerly adapted itself so perfectly to the atrophy of the bony and muscular framework beneath, wrinkles and sags. The loss of the sub-cutaneous fat and the atrophy of the bony and muscular framework accentuate the changes in the skin proper.[7] In the scalp, due to the fact that the skull does not atrophy and that its structure is different, a change, which in itself is a vicious circle, takes place; the more atrophy of the derma that occurs, the more shrinkage takes place, the more interference with the deep cutaneous net-work occurs, this in turn leading to more shrinkage of atrophy of the white fibrous tissue. Diminish the blood supply of the derma, and you are diminishing the vital blood supply to the hair follicle. We believe that the epidermis of the scalp does not suffer from lack of vascular supply because of the many anastamosing branches of the papillary and subpapillary net-work. Its structure being that of a cornificating character, it does not require the same amount of blood necessary for hair growth.

Treatment

With these ideas in mind, and the fact established that passive vascular exercise has been of benefit in the re-establishing of peripheral circulation, the author devised the following means for applying negative and positive pressure to the scalp, hoping that the pathological process, if on a vascular basis, might be stopped and perhaps reversing the process in a fair percentage of cases.

The apparatus itself is simple and easy to operate; basically it is composed of a compressor to supply the pressure, controls to regulate said pressures, and a head cap or helmet to apply the pressures to the scalp.

Method: The scalp is exposed for a period varying from thirty to forty-five minutes to the action of positive and negative pressures. Three complete cycles are completed every minute. The positive pressures employed vary from 10 to 20 mm. of mercury. The negative pressures employed vary from 80 to 120 mm. of mercury. It will be noted that the negative pressure is higher than that which is used for the extremities. The scalp appears to tolerate higher negative pressures more easily, and sometimes these high pressures are required to produce the desirable hyperemia. Occasionally pressures over 90 mm. of mercury produce petechial hemorrhages in the scalp, and this type of patient should receive more moderate treatment. The positive and negative pressures comprise ¼ and ¾ of the cycle, respectively. Patients complaining of heavy hair loss and those who are not extremely bald are treated once or twice, weekly. Severe cases are treated more often.

Results

From February, 1936, to date of writing 307 patients have been admitted to the clinic. Of this group, 72 patients are not reported because of diverse reasons they stopped therapy under seven treatment hours, or, are so recent that as yet they have not completed this period of time treatment.

The remaining group of 235 patients was divided into three classifications, as follows:

1. Patients not bald, but complaining of heavy loss of hair and of a receding hair line.
2. Patients moderately bald, with definite bald pates and high "widows' peaks," but still having temporal bands of hair.
3. Patients balder than group No. 2.

From each of these groups, in order to conserve space, only twenty cases were picked at random and are charted below. The charts given contain only premature and senile types of alopecia, unless otherwise stated. Duration is given in years and is taken from the time that the hair fell excessively. The adjectives used to describe the results, are, of necessity, variable, since like results appear differently on various degrees of baldness.

The mode of progress is as follows:

1. Excessive falling of hair stops; previous lanugo-like hair falls out; terminal hair appears and continues to grow in length and thickness, and begins to develop pigmentation.

2. The ingrowth of the hair is usually the reverse process of its loss, i.e., extension up both temporal regions until both sides meet, closure of the bald pate, and finally, the lowering of the "widows' peaks."

3. Hair already present is noted to grow at a more rapid pace.

4. Hair already present develops a more luxuriant sheen due, we believe, to increased blood flow to the sebaceous glands.

Conclusions

1. That, underlying the multiple causative factors of alopecias, a probable follicle undernutrition exists due to the deep vascular net-work deficiency.

2. That, by relieving this undernutrition, all types of alopecias are apparently benefited. That

RESULTS OBTAINED
GROUP ONE

Name	*Age*	*Duration of Baldness*	*Hours of Treatment*	*Results*	*Remarks*
J. S.	40	4	7	Very good	
J. C.	36	12	10½	Very good	
F. B.	35	4	10½	Very good	
M. M.	33	4	18½	*No results*	
D. B.	32	14	13	Very good	
L. B.	32	3	7½	Very good	Allayed all dandruff.
L. D.	30	4	8½	Good	
R. F.	30	3	10	Good	
D. C.	30	4	7	Good	
B. L.	28	1	10	Good	
J. H.	27	10	9	*Poor*	Long duration.
Dr. H.	26	4	17½	Good	
H. J.	26	3	12½	*Very poor*	
E. B.	25	2	10½	Good	
G. B.	25	2	8½	Good	
J. Mc.	24	1	34½	Good	
A. A.	24	1	7½	Very good	
W. G.	24	9	10½	Very good	
L. B.	23	4	15½	Excellent	
W. H.	17	1	8½	Good	

RESULTS OBTAINED
GROUP TWO

Name	*Age*	*Duration of Baldness*	*Hours of Treatment*	*Results*	*Remarks*
C. H.	53	13	14½	*No results*	Long duration.
Rev. F.	50	25	7	Very good	Long duration.
Dr. S.	41	12	30	Very good	Long amount of treatment.
K. W.	39	21	8	Good	
W. S.	39	7	7½	Good	
H. B.	38	19	13½	*Poor*	Long duration.
E. C.	38	6	7	Good	
P. F.	38	16	17½	Good	Persistent sinus headaches disappeared.
Dr. R.	35	5	15	*No results*	
Dr. K.	35	15	15	Good	
J. S.	34	11	15	*Questionable*	
E. K.	34	5	7½	Good	
L. F.	33	10	11	Good	
W. W.	33	15	8½	*Slow*	
S. Mc.	30	6	12½	Good	
W. F.	29	8	10	Fair	
B. M.	29	8	8½	Very good	
J. F.	27	9	12	Good	
R. L.	26	6	15½	Good	
R. M.	25	5	8½	Good	

RESULTS OBTAINED
GROUP THREE

Name	*Age*	*Duration of Baldness*	*Hours of Treatment*	*Results*	*Remarks*
E. H.	58	5	8	*Slow*	
A. B.	52	4	10½	Fair	Long treatment.
H. L.	51	21	11½	Good	Long treatment.
J. L.	49	10	8½	*Poor*	
M. A.	48	28	10½	*Slow*	
W. H.	45	24	11½	Good	
A. M.	44	19	12	*No results*	
Dr. S.	44	24	12	*Very slow*	
W. S.	40	10	7½	Good	
Rev. K.	39	19	17½	Good	
H. T.	38	6	16	Very good	
A. B.	37	10	12	Good	
H. W.	36	12	13½	Good	
L. K.	36	15	10	Good	
G. K.	35	20	21	Very good	
L. H.	35	20	21	Excellent	
S. H.	31	11	9	Good	
G. G.	28	7	21½	Good	
H. D.	23	7	9½	Excellent	
T. P.	17	3	25½	Excellent	Alopecia areata.

GROUP THREE REARRANGED ACCORDING TO DURATION

Name	*Duration of Baldness*	*Age*	*Hours of Treatment*	*Results*	*Remarks*
H. A.	28	48	10½	*Slow*	
Dr. S.	24	44	12	*Very slow*	
W. H.	24	45	11½	Good	
H. L.	21	51	11½	Good	
E. K.	20	35	21	Very good	
A. M.	19	44	12	*No results*	
Rev. K.	19	39	17½	Good	
L. K.	15	36	10	Good	
H. W.	12	36	13½	Good	
S. H.	11	31	9	Good	
W. S.	10	40	7½	Good	
A. B.	10	37	12	Good	
J. L.	10	49	8½	*Poor*	High age. Little treatment.
L. H.	7	35	13	Excellent	
G. G.	7	28	21½	Good	
H. D.	7	23	9½	Excellent	
H. T.	6	38	16	Very good	
E. H.	5	58	8	*Slow*	High age. Little treatment.
A. B.	4	52	10½	Fair	High age.
T. P.	3	17	25½	Excellent	Alopecia areata.

in all types of baldness the time required for alleviation is apparently in direct relationship to the age of the patient, the amount of his baldness and the duration of his baldness.

3. That this undernutrition seems to respond to alternating vacuum and pressure therapy.

4. That probably many adjuncts, such as: diet,[8] endocrine therapy,[9] radiation, vasodilators, irritants, etc., which were not used in order to not complicate the research work, and which alone are not entirely satisfactory, may aid this type of therapy.

5. That this type of therapy is of excellent preventive value.

6. That this type of therapy is slow in producing results.

7. That alopecia areata and totalis respond more quickly than the senile and premature.

8. That the hope is expressed for further work to rebuke or verify, augment, and adjunct results already noted.

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A Study of the Organization and Administration of College Hygiene*

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THE fifteen years' work in informational hygiene: A study of the annual proceedings for the past 15 years of The American Student Health Association reveals an interesting evolution of informational college hygiene.

The earlier proceedings show that the representatives of the colleges and universities attending the association were greatly appalled at the ignorance found in our college groups of the simplest scientific facts relative to hygiene. They were much concerned for the future of America if these college men and women in training for leadership were graduated from our educational institutions so steeped in ignorance and superstition relative to such an important social and civic factor. They pointed out the fact that personal, community and public health was a most important element of citizenship if people were to live successfully under complex civilized conditions. This lack of information on the part of the student body and the indifference to it on the part of college administrators engaged the attention of the association for many annual meetings. It culminated in the appointment of a committee under the chairmanship of Dr. Frances Scott of Smith College to work out and apply objective health knowledge tests.[1] These tests gave an objective scientific analysis of what had been recognized subjectively.

The Association realized that it was supported by the colleges and universities of America, and that as a distinct organized part of the educational system this condition was their problem to solve. Without any inclination to evade their duty, the outstanding authorities were assembled and the association began its work in earnest. In the report of the committee headed by Dr. Chenoweth,[2] we find Dr. Sundwall of the University of Michigan saying, "We trust that the time is not far distant, and it is our job to hasten its forthcoming, when the administration and the faculty of a college and university will forcibly sense the utmost importance of seeing to it that each young man and each young woman, upon whom a degree is conferred and, therefore, is underwritten by the college and university, is equipped with that knowledge and those attitudes and practices which will assure, in the very largest measure, a long lasting, sound, vigorous, harmoniously developed body machine, until that time comes college hygiene has not functioned adequately and the college administration will continue to graduate students who will not measure up to the specifications which society requires of the college graduate. . . . The time has come when we should no longer take a servile demeanor toward college hygiene and its related activities nor should we tolerate the condescending attitude toward it by our fellow academicians. We must insist on and command respect for college hygiene."

So for several years the Association studied various angles of the problem concurrently. The lack of knowledge of the scientific principles of hygiene was measured objectively. The effects of this handicap upon man's social, economic and civic progress were evaluated. The more efficient plans of bringing this to the attention of the college administrators and those in charge of curriculum construction were studied. However, during all this time the Association was not neglecting a study of what could be done with the conditions as they were, with their many handicaps, toward mitigating some of the dangers of hygiene ignorance.

The possibilities of individual instructions were diligently and scientifically studied. When the student presented himself to the college dispensary or college infirmary for treatment, what could be done to educate him as well as treat him? What should be the psychological and educational approach to give him a scientific attitude toward his own personal hygiene and its relation to the community hygiene? What possibilities were afforded during the physical examinations to give personal hygiene instructions? What was the best approach to be used by the team physician and physical education instructor in personal individual instruction in hygiene? The individual experience and study of these questions were freely exchanged and standard methods and procedure recommended at the annual meetings.

At the same time the opportunities afforded by lectures during freshman week or non-credit lectures during the freshman year were studied. Methods, devices and special plans for this procedure were devised and presented. A careful selection of the most essential subject matter for these lectures was organized and presented for trial and discussion on the part of the membership. The correlation of hygiene with other subject matter courses, the phases of the subject best

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suited to such courses and methods to interest those in charge of them were freely investigated and presented. During all of this time, however, the Association did not lose sight of the greater and ultimate goal. Every college graduate, so trained in the scientific knowledge of informational hygiene that he would be prepared for effective leadership was an educational ideal that persisted. Consequently constructive study and research toward this goal continued.

The National Conference on College Hygiene

At its 1930 annual meeting this Association passed a resolution calling for the operation of a college program which should include instruction in and development of physical and mental health and the supervision of the care of student health. The following June it collaborated with the National Health Council, and the President's Committee of Fifty on College Hygiene in a National Conference on College Hygiene held in Syracuse University.[3] This meeting set up certain definite, desirable standards relative to informational hygiene. Almost five years have elapsed since this National Conference and we are in preparation for another. What was the response of the colleges and universities in our membership to this research, study and recommendations?

To ascertain this your committee sent a questionnaire to the president of each member institution. Another was sent to the director of each Student Health Service. The results of these were then studied with the latest catalogue of each institution. Questions arising were then taken up by personal correspondence with the president, registrar or director of the Student Health Service.

By this procedure we were able to obtain what we believe to be accurate and reliable information from 104 institutions. There are 126 institutions in our membership.[4] When we exclude the medical schools, technical schools, theological schools, schools engaged in college preparatory work and the two-year normal schools, we were able to make a reliable study of all of our institutions giving undergraduate college work with the exception of the following seven. The University of Maryland, Howard University, Swarthmore College, Villanova College, Hampden-Sydney College, Trinity College and Rhode Island State College. .

Institutions requiring hygiene with academic credit: The sub-committee on courses in hygiene of the National Conference outlined the minimum contents of a course in informational hygiene and made the following specific recommendations:

1. College students should be required to secure the training outlined in the above course.
2. All courses in informational hygiene in college should be given academic credit on the same basis as other subjects.
3. There should be a required course in hygiene in all institutions of collegiate grade.
4. Six semester hours should be regarded as the ideal time allotment for the required hygiene course and in most institutions the time allotment should be probably not less than two or three semester hours.

The conference as a whole made the following specific recommendations:

1. Every college should include in its hygiene programs a course or courses of informational hygiene that will help the college satisfy its health obligations and educational purposes.
2. College informational hygiene courses should be concerned with the history of human health and with the important scientific principles that determine the production, maintenance, injury and defense of physical, mental and social health, and with the influences of those principles upon the behavior of the individual, the family and society.
3. Courses of instruction in hygiene should be required of all students for a total of not less than two or three semester hours.

The conditions existing in the institutions included in our membership relative to those recommendations are shown in Graph I. Fifty-seven institutions require of all undergraduate students a course in hygiene for which academic credit is given. Forty-seven have no such required courses.

As to the number of hours required. 31 require two semester hours, 16 require one hour, six require three hours, and four require four hours or more.

The larger universities have had the most difficulty in establishing required informational hygiene courses for all undergraduates. In the 21 state universities only eight have such courses while 13 have no requirement. Only 38 per cent in this group have such a requirement as compared to 55 per cent in the whole group. There seems to be two major causes for this.

The first cause results from the rapid increase of the undergraduate body in the large universities. The older and better organized departments have had difficulty in expanding rapidly enough to care efficiently for this increased enrollment. Consequently there have been no resources or opportunity for the younger departments to attempt to meet the increase adequately. Princeton University is a typical example. The following statement from Dr. Joseph E. Raycroft of that institution gives their experience: "A course in public hygiene, conducted by members of this department was required in 1911 of all freshmen and continued for 15 years or so. This was a two-hour course for one semester, consisting of lectures, hour tests and final examinations. As time went on the size of the undergraduate body increased more rapidly than the teaching personnel of this department so that it was impossible to divide the class up into sections based upon the student's knowledge of hygiene and so make possible a desirable modification in the type and presentation of material. Under these circumstances we were obliged to deal with the class in three groups of approximately 200 each. This plan of teaching appeared to us to be wasteful and ineffective; therefore, some six or eight years ago we discontinued the course. If it were possible I should like very much to be able to supplement our program with a general course in hygiene in which students can be grouped into small sections, according to their knowledge of hygiene as determined by preliminary tests, which would permit of recitations and discussions."

The second cause grows out of the fact that some of the larger universities have well organized and efficient departments of hygiene. They have a number of students who are interested in the subject and elect it as a minor or major study. These capable and interested students consume the finances and energy of the department. These departments feel that they can serve the cause better by concentrating upon this interested group than by dissipating their energy and resources over the whole undergraduate body.

Another comment that should be made on Graph I concerns the 16 institutions requiring only one hour of hygiene. In most cases these courses are given in connection with required courses in physical education. One hour per week is devoted to hygiene instruction. This is predominately personal hygiene and no attempt is made to cover the field of informational hygiene.

The title used and the departments in charge of hygiene: Graph 2 indicates the general title used for the required academic credit course in hygiene. Thirty-seven institutions use the general title of hygiene, 16 use the general title of physical education or health and physical education, two use health education, one education and one preventive medicine.

Graph 3 shows the departments which have charge of the hygiene instruction. In 48 institutions the instruction is given by the physical education or health and physical education department. Thirty institutions have separate departments of hygiene or health. In nine institutions the hygiene is in the department of biology; in four it is in the department of physiology and in two institutions in the department of public health or preventive medicine. There are only nine institutions that do not offer hygiene courses for academic credit. In 11 institutions it is offered only for special groups.

Administration and the teachers of hygiene: The National Conference made the following recommendations relative to the administrative set up of the Student Health Service.

1. That all college health teaching and student physical welfare activities including health service, physical education, and inter-collegiate athletics should be co-ordinated either in one administrative unit or under an equivalent that may be adapted to the conditions in a given institution.
2. The committee was strongly of the opinion that the efficiency of the members of the staff in their work with students will often be measurably increased by an assignment of duties in two or more of the fields of activity that are included in the administrative unit.

The status in our institutions relative to this recommendation as it relates to informational hygiene is shown in Graph 4. In 74 Student Health Services, one or more members of the Student Health Service staff are teaching hygiene. In 30 institutions no member of the Student Health Service staff teaches. In 18 institutions all of the members of the staff teach regular organized classes in hygiene. In 11 institutions all the members of the Student Health Service except one do some teaching of hygiene, and in 13 institutions one-half or more of the staff does some teaching. The total percentage of the Student Health Service staff teaching hygiene is 40 per cent. The teaching load, however, is very light. The average number of semester hours per staff members is 3.95 hours.

The director, college physician or Student Health Service staff directly supervises the teaching of informational hygiene in 60 institutions. In 34 institutions it is supervised by some other department. Nine institutions do not offer any regular hygiene courses.

The Conference on College Hygiene recommended high standards of preparation for teachers of college hygiene. Graph 6 shows the major degree held by teachers teaching hygiene in our institutions. The specific training and preparation for teaching is another study and report. Here only the major degree is reported as follows: M.D., 151; Ph.D., 27; D.P.H., 9; A.M., 92; A.B. or B.S., 21; R.N., 2. Most of those holding the M.D. degree hold other degrees in public health or a degree in education. This study indicates that for every position for teaching of hygiene there is available a candidate with an M.D., Ph.D., or D.P.H. degree with special training and preparation for the work, and the tragic part is that they are available at the same salaries paid teachers with less training and preparation.

Elective Courses in Hygiene: The American Student Health Association has not neglected its duty in the study of informational hygiene courses of college grade for elective courses in undergraduate study. The research relative to such courses, their organizations and correlation has occupied much of the time of the Association. The annual proceedings of the Association for the past 16 years show that this study under the leadership of Drs. Storey, Brown, Smiley, Sundwall and many others has been persistent, scientific and educationally sound. What has been the response of college administrations to the results of this 16 years of work?

Graph 5 answers this question for the institutions in our membership. Seventy-one institutions offer one or more informational hygiene courses of collegiate grade that may be elected by all undergraduate students. Thirty-three institutions offer none.

In the 71 institutions offering such courses, 22 offer one course, 22 two courses, 27 offer three or more such elective courses. The average number of semester hours of electives so offered is 9 1/6 hours.

There are 20 institutions among the 47 not requiring any informational hygiene for credit that also do not offer any elective hygiene courses. In other words there are only about 20 institutions in our membership that have not recognized informational hygiene as an academic subject and either as a requirement or as a general free elective included in the academic college curriculum with academic credit on the same basis as other subjects.

Summary

A study of 104 institutions, all but seven included in the membership of the American Student Health Association that give full undergraduate academic work, shows the following: Fifty-seven require one semester hour or more of informational hygiene for which college credit is given. Sixteen require one semester hour; three, two semester hours; six, three semester hours; and four require four hours or more.

The department having charge of the instruction is the department of Health and Physical Education in 48 institutions. A separate department of hygiene or health in 30 institutions, the biology departments in nine institutions; the physiology department in four institutions; the department of public health or preventive medicine in four institutions and nine institutions have no hygiene.

One or more members of the Student Health Service staff also teach one or more classes in 74 institutions. The total percentage of staff members teaching is 40. The average number of semester hours each teaches is 3.95. The student health service supervises the teaching of hygiene in 60 institutions.

The major degree held by the teachers teaching hygiene is M.D., 151; Ph.D., 27; D.P.H., 9; A.M. or M.S., 92; A.B. or B.S., 21; and R.N., 2.

Seventy-one institutions offer one or more elective courses in informational hygiene, that may be elected for college credit by all undergraduate students. The average number of such semester hours is 9 1/6. There are only 20 institutions that neither require hygiene with academic credit nor offer it as a general elective.

Conclusions

Educational institutions are very conservative in changing the curriculum. Their revision takes place either slowly or at the end of long periods of time. If we consider these facts, this study shows that the 16 years of services of the American Student Health Association for our educational institutions on informational hygiene has borne excellent results. It also indicates that a sufficient number of institutions has adopted or partially adopted the recommendations of the National Conference on College Hygiene to have justified the Association in its collaboration with the President's Committee of Fifty on College Hygiene and the National Health Council in such a National Conference. As the period arrives when other institutions revise their curriculum, this accumulated research and study will be of inestimable value to them and bring to thousands of young men and women in training for national leadership the value inherent in the study of the science of informational hygiene.

Some of the interesting things to notice in any such study as this are the trends that are arising. Trends that arise spontaneously themselves without any organized direction may indicate what the nature of the future development is to be. They are like sports that arise in the plant and animal world that will better adapt the organism to its environment and thus determine the future animal and plant life. In the voluminous correspondence connected with this study two such distinct trends are indicated. They should be watched with interest.

One is the tendency on the part of some institutions that have recently revised their whole curriculum to require recreational physical activity without academic credit and transfer the academic credit formerly given for such activity to required informational hygiene courses. The substitution of naturalized physical education for the old formal gymnastics has tended to make the physical activity program in liberal arts courses a program of free and supervised play and organized sports in intramural activities. Some deans seem to feel that academic credit should not be given for this activity but rather to that part of the health and physical education program that conforms more nearly to academic subject matter.

The other trend is to give non-credit instruction in personal hygiene in the freshman year, and defer the required college credit course in social, mental and community hygiene until the second or third year. Personal and group conferences on personal hygiene during freshman week, at the time of the physical examination and the subsequent checks on the findings of this examination, at the periods that the student presents himself at the dispensary or hospital for treatment, the personal advice and guidance of the physician of the athletic teams and physical education instructor, takes care of the personal hygiene. This supplemented by non-credit lectures completes the freshman program, and gives it at the time it will be most valuable for the personal physical welfare of the students. With the academic credit course postponed to the second or third year, the student will have obtained a background in the physical, biological and social sciences that will enable him to profit more from the study of social, mental and community hygiene.

REFERENCE

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Discussion of the Paper of Dr. A. O. DeWeese on the Organization and Administration of College Hygiene

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Dr. DeWeese, in his remarks aside, indicated that he would give us a résumé of the status of hygiene teaching—past and present—and would leave to us who were to discuss his paper the problem of the future of hygiene. In a way this was fortunate, for Dr. DeWeese covered his ground extremely well, leaving very little for us to discuss. On the other hand none of us is a prophet and the only thing one can do is to indicate what one considers to be good hygiene teaching.

Those of us who are teachers of hygiene have been concerned for a long time about the ignorance of mankind in general health knowledge and intelligence. Dr. Haven Emerson at our luncheon meeting today painted a rather gloomy picture of the situation, I thought. Intelligent people know more about health than they practice. Then again other college teachers paint a gloomy picture of the ignorance of students in their departments. Sometimes the amount of knowledge carried away from a given course is amazingly little. For example, I try to teach my students in Community Hygiene (a Sophomore course) how to derive various rates (mortality, morbidity, case fatality, birth rates, etc.) by substituting in simple algebraic formulas. In spite of having had required mathematics courses in high school and the first year of college these students seem to have difficulty in understanding the derivation of these very simple rates.

The ideas that people have concernng health come, I think, from four general sources: (1) Racial tradition or mores—conceptions and misconceptions handed down in the family or in the group, (2) food and drug advertisements—on the printed page and over the radio—not intended to give the whole truth but to sell certain articles, (3) public school instruction—not an important factor in the past, (4) experience from illness and contact with the family physician, clinic or hospital. The college course in hygiene usually fills a very definite need, for there has been no thorough scientific instruction in health in the student's past.

Hygiene has had a difficult time establishing its place in the curriculum. You will remember that universities were essentially medieval institutions, and that scholasticism dominated them from the beginning. The Renaissance, it is true, brought a revival of ancient learning, but as there was little scientific knowledge to revive even the physical sciences remained neglected. In the nineteenth century Herbert Spencer, Thomas Huxley and others had great difficulty in introducing the sciences into the very conservative institutions of higher learning in England. Universities are just as conservative now as they ever were, and hygiene, the newest of the sciences, has had great difficulty in gaining a foot-hold. Dr. DeWeese has pointed out the rather large percentage of colleges who offer no courses whatever in hygiene. The enormous amount of scientific material which forms the basis for the teaching of hygiene remains a closed book to the great majority of educated people, for even in the institutions where the subject is taught, so little time and energy is spent on the courses that many of them are worthless.

The problem of teaching health is complicated for the instructor, because the members of his classes have such varying degrees of background and preparation. It is different for those of different interests and motivations, for boys and for girls, for city dwellers and for those coming from the country. I feel that the various courses should have several definite objectives: (1) The instruction should be interesting to the student and stimulating to his imagination. (2) It should be practical and easily applied to everyday living. (3) It should be of such a nature as to change bad habits into good ones. (4) Above all it should be of such a nature as to add to the intelligence, the culture and the background of the individual.

It is interesting to note from Dr. DeWeese's figures that about 40 per cent of health service workers are also classroom teachers of hygiene. Other things being equal, the practical health worker should make the best teacher. Unfortunately this is not always the case, for teaching is an art in itself. The individual who possesses skill in teaching and ability in health service work should be of the greatest value to the modern educational institution.

An Address*

The Integration of Pharmacy and Medicine

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Mr. Chairman, Ladies and Gentlemen: It has been my privilege on previous occasions to visit this state. I have the pleasure of knowing many men and women here. I want to be equally frank as to my purpose in making this trip halfway across the continent at a busy time. I am here representing a very profound interest in what you people are doing in this Inter-Allied Professional organization. I am not only interested in it personally, but from an organization standpoint, and the standpoint of my experience in various fields of this public health effort.

Some days ago I said to the Dean of the Pharmacy School in the University of Maryland, where I was formerly a teacher: "Do you realize the Pharmacists attend the same school four years, and the medical men four years, and the dentists and nurses the same length of time, and they practically have no speaking acquaintance during that entire period? Yet we expect when they leave this institution, they will begin to be very co-operative." As a matter of fact, it is almost accurate to state, unfortunately, due to our method of education, we hardly speak a common language. I firmly believe that unless we do realize the necessity of this type of co-operation you are carrying on out here, we might as well face the fact that other agencies will take charge, to a considerable extent, of the activities we think belong to us.

I am here because of that interest. I want to pay a very sincere compliment. I hope you won't accept it as the ordinary acknowledgment of a visitor to you people for having first put this plan into actual working operation. I know states with a similar set-up. It is operated through committees and through selected leaders. They do a splendid job, but they fall short in this respect: While they work together, they work together separately, if you can express it that way. They do not come together to discuss the problems in the frank way you are beginning to do.

Dr. Hopkins referred to my connection with the Board of Health. Some years ago we decided in Maryland we would carry on this type of co-operation in actual association, so far as the Board of Health was concerned. We asked the board to permit us to modify the law of the state to provide that a pharmacist should be a member of the Board of Health; and in addition to the Food and Drug Commissioner, we have a deputy —one a trained field man and one a pharmacist. We transferred our laws affecting pharmacy to the Board of Health. We got a liberal education. Some times when its sessions have occupied two or three hours, and the chairs are hard, it has not been a pleasant experience; otherwise it has been a pleasant and beneficial experience. We come to know what the public objective is. We know some of the problems the medical men and dentists and veterinarians have to meet. Unless we take that point of view and are willing to give and take to the point of making this a co-operative effort, we may expect some kind of governmental regulation.

Once I said to a group of pharmacists, "If you want to avoid what other countries have experienced in respect to governmental control and dispensation of medicine, it will be prevented by giving the public the type of service they need. If not they will get it some other way."

Some years ago I was in Canada at a joint meeting with representatives of the British Pharmaceutical Society. I heard the Canadians discussing as a remote possibility some regulation restricting pharmacists in Great Britain. They thought with an ocean three thousand miles wide between them it would not happen to Canada. Within two years it was an accomplished fact.

When I have to discuss pharmacy work in general with governmental agencies, I find they have the highest appreciation of the work our professors have done in developing standards for regulating of standards used in treating disease. That recognition goes far beyond where Dean Serles stopped. He would close practically with the idea the actual drugs and medicines used in the treatment of disease are accurately standardized and dependable. There are no other phases to this matter that are corollary to that and make their job all the more valuable to us and the people we serve.

This standardization goes so far as to attempt to select within reason, and it has a function in that respect that is not ordinarily understood. There are several others. We can realize our profession, as far back as one hundred twenty years ago, voluntarily set up for its own regulation and control stringent standards for the articles they were to use, and voluntarily subjected themselves to those standards. The American public thinks the regulation of these products came as a result of the Pure Food and Drug laws, and certainly they have added to the effectiveness of control. But one hundred years before that we had the temerity to regulate ourselves. It is a great compliment to the profession when Federal and state government need standards, they were provided in these drugs to which Dean Serles directed your attention.

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*Read before the Allied Group Joint Meeting of the South Dakota State Medical, Dental and Pharmaceutical Association, May 7.

†Secretary, American Pharmaceutical Association.

With respect to these books of standards, I happen to occupy a peculiar position. I am a member of the Board of Trustees of the U. S. P. I am secretary of the association which issues the National Formulary. We must see this question of regulation from a broader viewpoint than the Committee of Revision. We must finance it. I should like to supplement and support what Dr. Joslin said about business making some effort to finance itself. The Pharmacopoeia has never had a gift of one cent. It conducts an enormous business enterprise, not only in finance but in extent of activity.

Many years ago I appeared before an important group, and somebody mentioned the Pharmacopoeia. A nationally known architect said, "What's that?" I tried to tell him. I expected to catch a train to get home. When I got through, he said, "Come to lunch. I want to know more about this." My great difficulty was to make him understand the Pharmacopoeia finances itself. His concluding comment was, "You people in Public Health professions are a bunch of idiots. You have made one of the finest contributions to the public welfare," and too many folks, as this fellow, have never heard of it.

If you realize the importance of this activity then what I have to say to you will not fall on barren ground. I believe this effort has suffered in two or three respects. I should like to tell you what those in direct control of this work are attempting to do to remedy the defects. We have depended on the fact when you set up an accurate standard for a drug you have discharged your job. You say, "The doctor should have interest enough in that and think of his responsibilities to the public seriously enough to acquaint himself with it."

It is a difficult operation to acquaint oneself with some of these things. First, there should be some means of making these standards and their value and effectiveness better known to public health users of the book. Secondly, I think we proceed on the theory which is no longer good, that until a drug or method of treatment had thoroughly established itself, it was not worthy of standardization. I could agree with that if I had lived one hundred years ago. We must modify the revisions of dependable standards to that extent. Thirdly, I think we are not associating these books sufficiently with the every-day work of the practitioners themselves to have them reflect their needs. You will probably realize the Pharmacopoeia was the first piece of standardization in this country. It proceeded on the theory it should provide standards and prescriptions for those articles known to have therapeutic value, and were necessary in the treating of disease. We did not know so much about prevention then. The Pharmacopoeia was an unknown book.

Later we found if one book attempted to standardize these articles it became unwieldy in size. It was decided to set up a second standard which would deal with preparations as to symptoms. You will find a standard of preparations in the secondary publication, which is the National Formulary. The Pharmacopoeia and National Formulary were formed not to recommend articles in which pharmacists claim proprietary rights. The American Medical Association filled up that gap by setting up the Council on Pharmacy and Chemistry, and issuing "New and Unofficial Remedies." I join Dean Serles in offering no criticism of those which represent real contributions to progress in the treatment or prevention of disease.

The ground is well covered. It would be interesting to discuss the methods by which this is attained. Let us take up the three items. The first would be the breach from traditional policy. Until we have done so, we would not attempt to standardize articles until they are actually in use and proven through merit. What has happened to cod liver oil? In my relatively brief time in this work I have been taught cod liver oil had four values, each succeeded by another. If the Pharmacopoeia would wait until this form of standardization had been settled, there would be little need for it. It stepped out of this traditional vitamin field to establish standards in advance of the preparation and forms in which the article is to be used. They set up a Vitamin Board and invited such men as Dr. Sherman, from Columbia, and Mr. Nelson of the Government Laboratory to serve on the board to weigh the evidences submitted.

Recently we have set up a board for the study of liver products. These extremely busy men are giving their time and attention to the betterment of the general public. I think you can expect to see those standards made usable because of this development in standardization of articles in advance of their established value. That is an added feature of service the Pharmacopoeia is trying to render.

Second, the Committee, composed of the group of experts, must sit in judgment. That is a difficult job. I have never been a member of that committee. It has been the policy of those books to reflect the needs of the medical practitioners. In the last revision we made critical studies of prescriptions, and hospital workers will find out what the physician, the dentist, and others actually require and National Formulary accurately reflects actual medical practice.

That is open to serious criticisms. It may tend to perpetuate the old. I think we must hold onto the old with one hand and reach out for the new with the other. If we return to the old now, we will have serious difficulties. That means that these books will in the future more nearly reflect actual practice or use, rather than just the opinion of experts. It must be guarded carefully. You can think of cases where it might not be effective. I am sure we are trying to remedy that defect—the failure of the physicians to make the greatest use of this work. I do not think the busy members are altogether to blame. I think the Pharmacopoeia authorities are, to a reasonable extent, to blame. They have not exercised due diligence to make the value of this work known or to present it to the physicians in a usable form.

The Pharmacopoeia has recently set up a committee called the Committee on Information about Official Drugs. I am a member of that Board of Trustees. We have had a number of meetings to discuss what could be done to remedy this defect. I think busy physicians would recognize the value of the preparations standardized in the Pharmacopoeia. They would know it represented not standardization by an outsider, but by the best minds of the group. They would have confidence in it. It is difficult to keep up with progress in those things. The physician has a wide selection. We are attempting to carry out a program like this. Don't get the idea it is a fixed thing. We are trying to discuss with groups like this the program, and have it shot to pieces until it is reasonably dependable. We feel that the classification of these products should be more definitely drawn to the attention of the practitioner.

We are inviting a group of medical experts to discuss the value of certain classes of products in the Pharmacopoeia—those used in the treatment of cardiac troubles, for instance. A prominent medical expert is asked to discuss those briefly, and we have an arrangement with the American Medical Association to print the discussions in its Journal. We hope to bring to the attention of the practitioner those products in the Pharmacopoeia and accompanying books useful in these conditions. That will take time. If that program is repeated and conditions change and progress is made, we can keep the physicians well informed of these changes.

We hope to present a similar program to the dentists and others interested in that line. We are planning to present to the pharmacists through their publications information in advance of editorials or articles appearing in medical publications. We will then be in position to discuss with other groups interested the information which is going to appear later, and turn it to their practical use, as well as your own.

It has other ramifications. We have for years had exhibits of official products at meetings of the American Medical Association and others, trying to convey to attendants in visual form definite information about the changes in these standards.

We are attempting another step which is basic. I can illustrate it by example. We have a standard for aspirin. We know very few people take aspirin. They take some form of the drug itself. Whatever may be this form, it is not only supposed to have the standards of the original drug, but if a person attempted to make tablets and did not understand his job, he would wind up with a tablet that did not represent aspirin. It is important to standardize it as the physicians use it. We will cover that gap to a greater extent than heretofore.

It seems to me these publications and this work I have attempted to bring to your attention have a very decided place in our discussion of the cost of medical care. I dislike to put it on that phase without an explanation. You will remember a few years ago a committee was set up with distinguished representatives—Dr. Wilbur was chairman—to make a study of this critical situation. The title was "The Cost of Medical Care," recognizing that this matter has a great deal to do with it. We hope by this effort we can bring to the attention of the practitioner these forms of medication which we believe can be depended upon not only from the standpoint of selection and effect. We hope he can make use of them to the interest and welfare of himself and the public.

It is my thought that I am safe in assuring the other members of this group of the desire of the pharmacists of this country to give you the most effective service possible in every sphere of activity. The Committee on the Cost of Medical Care made the definite statement that drugs and medicines and medical supplies are essentials to an adequate medical service, both preventive and therapeutic. It is probably the greatest justification for our group in public health.

Of course just the furnishing of items does not cover the services, but it is a primary part of the service. If, as the committee shows, these articles are dangerous if unwisely used, we have a new picture of their importance in medical care, and the absolute necessity of having them furnished dependable in quality and at the most reasonable cost possible, certainly we do not misunderstand what is meant by cost.

Recently I was invited to appear before the American Academy of Science to defend our position with respect to an advertisement sent out by a chemical concern, which said, "Those C. P. chemicals are purer than those of the Pharmacopoeia." That excited the members. I tried to tell them we are not using medicine for analytical purposes. If so, they should be of C. P. purity. Those articles are used in the treatment of disease. In many instances, the removal of a small excess of harmless material greatly increases the cost of production. It would seem to us to be foolish to insist upon that grade of purity. We do say those articles used for medical purposes and the prevention of disease must be sufficiently pure for the purposes intended, and at the most reasonable expense possible.

You may rest assured that is the desire of the pharmacists of this country. They have great difficulties, as the rest of you have. We recognize them and we regret many of them. They do not necessarily interfere with their value to public health service. I think the pharmacists, by the means I have outlined, are better qualified to serve you.

Once I had the privilege of speaking to the medical classes of Johns Hopkins Medical School. I tried to leave this thought: Unless you establish a relationship with your pharmacist, so you can discuss your problems, how can you work harmoniously with him?

Now I am going home very well satisfied with having traveled halfway across the continent. I can say to other groups in other states that this Inter-Allied Professional Co-operation is not a theory. It is an actual fact. It is not only a fact, but it is also in practice. There is a state that not only talks about inter-professional relations, but does something about it.

It is my hope that I have been able to tell you something about the difficulties of our side of this activity. I hope to have the opportunity in the near future to come back and see what I believe will be the case: That this Inter-Allied Group not only started this, but has carried it on a very substantial and lasting basis. I cannot conceive of a group like this who will not go on with this great program.

May I thank you heartily for the opportunity of speaking to you.

Management of Strabismus

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THE objects of this paper are: First, to emphasize the importance of the proper treatment of the various kinds of strabismus as soon as they are evident no matter how early this may be. Secondly, to make the general practitioner realize that squints should have expert care from the beginning and that parents must not be told to delay treatment in the hope that the condition may be "outgrown." Such advice often results in loss of vision, monocular and binocular, thus being the direct cause of most of our difficulties in the later handling of these cases.

It occurred to me that a paper for this meeting, covering these points, might be worth while because ophthalmologists see so many patients whose parents have been advised (so they claim) by the family physician, and even by pediatricians, to delay treatment in the hope that time alone will effect a cure.

It must be understood that, in all forms of strabismus, the deviating eye is out of use as far as direct vision is concerned. Hence, if the condition is not treated early and properly, one or more of four changes will occur: (1) The direct vision of the deviating eye becomes reduced and, at times, lost. This does not occur in cases of alternating squints. (2) Binocular vision is lost or never learned. (3) Bad muscle-nerve habits occur as explained by Sherrington's Law of Reciprocal Innervation of opponent muscles. (4) Permanent alterations in the relations of the orbital tissues the result of the deviating eye being misdirected so long.

Inasmuch as these changes interfere with the securing of good results, it seems more intelligent to follow a line of treatment intended to prevent their development in preference to one that allows them to occur making it necessary to expend much effort later on in the hope of undoing them, usually only with partial or no success.

It thus becomes very evident why all these patients should be under the care of an ophthalmologist who is interested enough in this type of work to treat them properly from start to finish including operative correction should that become necessary.

Therefore, to free himself of all blame for later bad conditions (if for no other reason) the family medical attendant should refer all ocular anomalies at once to some ophthalmologist for him to observe and to do the right thing at the right time. He should not decide this by delaying such reference till he thinks it necessary. It is not fair to the ophthalmologist, not to mention the patient, to refer to him a pair of eyes more or less damaged by delay which seems to be the rule rather than the exception. If most states did not have time limits a great many malpractice suits would be in order with no hope of successful defense because no one has the right to give advice concerning conditions of which he is totally ignorant as proven by the advice itself.

Treatment

The best time to start treatment is when the squint is in the occasional stage or at about the sixth month if the eyes have never been straight.

In the occasional case the child is usually old enough to examine at once and to wear any needed lens correction. In the latter case the treatment is continued alternate occlusion in order to keep each eye in use half time and so prevent all the changes mentioned above except those relating to binocular vision. However, it is much easier to train binocular vision later if good sight and normal ocular rotations have been preserved in each eye.

Retinoscopic refractions can be made quite accurately as early as the twelfth month when any needed correction can be prescribed and worn. Babies seldom refuse to wear a needed correction.

If accurately fitted glasses fail to parallel the eyes, alternate occlusion must be continued, with occasional checking of the refraction, till the child is three years of age. If the eyes are still disaligned operative correction is then in order.

For many years I have contended that, if good vision and motion have been preserved in each eye, binocular vision will be learned in the normal way, provided the eyes are straightened by operative methods that do not interfere with normal muscular action. This is not a mere theory, because I have had many patients to prove its truth.

Until my cinch shortening was devised, no operation was available that was free from mechanical risk. Tenotomies are liable to produce a final over-effect (in convergent squint) causing a divergence which is far harder to correct than the original condition. Any method that calls for needle punctures of the sclera is, in my opinion, dangerous and not to be used because safer means are available. I am able to tell my patients that my operation is a tendon shortening only, and that the eye-ball itself is not touched. Hence there is no appreciable risk of damage to the sight (I have had no such case in approximately three thousand operations).

Advantages of the Cinch Shortening Operation

This method, which I devised in 1911 and reported first early in 1912 (Journal A. M. A., Mar. 2, 1912), has mechanical advantages so definite that there is no need for undue delay in operating. These are: (1) The tendon is not cut. (2) No tendon sutures are used. (3) The shortening is entirely in the tendon tissue. (4) No change can occur because the shorteners are not removed till the fourteenth day by which time the tendon loops are firmly united. (5) Binocular occlusion is not necessary, there being no stitches to pull out. (6) Monocular occlusion is not necessary in some cases. (7) No confinement is required. Many patients lose no time. (8) No chance occurs for adhesions to form between the tendon and sclera because the eyes are not put at rest by binocular occlusion. Such adhesions, after other types of operating, often ruin the result because the tendon acts to rotate the eye from the rearmost adhesion instead of from the normal insertion. (9) The only risk connected with the operation is that of the anesthetic and of the results of infection. These, of course, are present in all types of operations.

Indications for Operation

Consequently, when non-operative measures have failed, further delay is harmful and operative correction should be started. This has been my practice for over 20 years and as yet I have had no occasion to regret it, certainly none that can be compared with the harm that results from a "do nothing" policy.

I adapted to the ocular tendon a scheme used by horsemen to shorten saddle girths (cinch) hence the name "cinch shortening." Figure 1 shows the idea in a diagrammatic way. Study of this shows that, after the shortening strands have been pulled straight, the tendon is shortened by their circumference, and that without any constriction of living tissues such as occurs in all suture operations. The tendon strips constrict the shortening material.

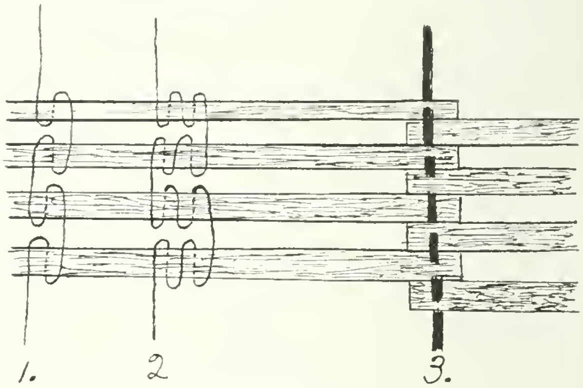

FIGURE 1

Showing: 1. Course of single over cinch loops. 2. Course of double over cinch loops. 3. Shortener, after straightening, which transfers the loops and makes the shortening.

It must be remembered that strabismus is a symptom and may be due to a number of causes and conditions. Vertical deviations are frequently the cause of lateral and must be carefully looked for in the pre-operative study of all cases. Whenever I find them I know that there will be much trouble, and possibly a number of operations, in securing a satisfactory result. Sometimes shortening a superior rectus as the only operation will cause the disappearance of a horizontal squint. Such a case was shown at the 1923 American Medical Association meeting. In another, such an operation corrected the vertical deviation and also a divergence of 25 degrees. These happenings suggest the idea that we must, if possible, find the true cause of the squint in each case and not handle them all in the same way by rule of thumb methods such as "cut the internus and shorten the externus."

In all cases possessing binocular vision, and in those in whom we hope to develop it, normal action of the opponents must be preserved in order to save convergence and parallelism in all directions of binocular rotation. This can be done only by using non-mutilating operative methods.

A case of squint is not cured unless the eyes are parallel which can be shown in young children by symmetrical pupillary reflections of a point of light. Mere improvement is worthless from the visual standpoint because the deviating eye is still out of use.

Muscle Exercises

There has been a great furore lately over "muscle exercises." As such, the only good done is to the bank account of the one who directs them. The exercises incident to "fusion training" are entirely different, being really brain exercises intended to teach the eyes to work as a pair (binocular vision). These are so complicated that, when most needed in young children, they cannot be used because of a lack of interest and a lack of the ability or desire to concentrate. It is chiefly for this reason that I believe in paralleling the eyes as close to the third birthday as possible thus permitting binocular vision to develop in the same way as in those whose eyes are straight.

Routine Eye Examinations before Starting to School

There is an old saying that "a good start is half the battle." Many children never have this "good start" because of refractive errors or muscle troubles or both. Frequently children struggle along with disabling eye defects for years which, before they are discovered, may cause backwardness in their school work and often a reputation for dumbness. It is not unusual to see cross-eyed children having their teeth straightened. I am always amazed at a line of action that favors such wonderful care of the teeth which, compared to the eyes, are relatively unimportant organs.

It must be emphasized that an accurate refraction cannot be made in children unless the muscle of accommodation is paralyzed by atropin in some form. This, of course, means that a non-medical examiner should not be permitted to make these examinations.

In view of the fact that dental checks every six months are considered advisable it does not seem too much to ask for at least one thorough eye examination before a child starts to school. Any further ocular care will then depend on the results of this first test.

Student Health Service as a Part of the Medical College*

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IN SPEAKING on student health service before this Association, composed as it is of experts in the field, it is necessary for me to review the ideals of health service and, briefly, the development of these ideals in very recent years. I do this to orient myself and to afford a background against which I shall attempt to show the difficulties which one meets in developing a student health service in a college of medicine and the importance of overcoming these difficulties. Some of my remarks will seem trite to you. I trust that you will be indulgent.

At the University of Tennessee, student health service owed its inception to the observation that many students were impeded on account of illness. Some were unable to secure satisfactory medical care and some had quite inadequate ideas of the conditions prerequisite to good health. The University sought to provide medical care for all so that each might give his best energies to his studies. In order that a student should not lack this care on account of poverty, the health service was financed by co-operative effort, each student being required to pay a health fee. Thus, in the beginning, the purpose of the University was to provide care for sick students and the method of financing was socialized.

Almost at once it was obvious that great advantage would be gained if cases of illness were detected as early as possible and corrective measures instituted. Thus the health of the students might be maintained more and more nearly at normality and the expense of care reduced. The development of periodic physical examinations of all students, even those apparently well, continued the effort at the early detection of any abnormalities. The examinations proved decidedly effective.

After the development and standardization of the periodic physical examination, the limit was reached in the early detection of disease. The next step was bound to be increasing emphasis on the preservation of health by attempting to anticipate and prevent even minute aberrations from normality. The first and most obvious procedure was the use of such tests as are available to determine susceptibility to contagious diseases followed by appropriate efforts to secure immunization. It is clear, however, that a positive program for the preservation of good health must rest on a much broader foundation than immunization against a few contagious diseases.

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*Read before the Sixteenth Annual Meeting of the American Student Health Association, New York City, December 28, 1935.

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It was at this point that those interested in the improvement of student health service realized that they must enter the field of education and do so in earnest. The first step in this direction was the organization of a thorough course in hygiene and its incorporation in the curriculum. Since such a course necessarily included instruction in the right use of exercise in maintaining health, the sensible control of diet, and the importance of sanitation, contacts with other college agencies already well established were inevitable. It was necessary to bring into co-ordination the work of the physical education department with its organized exercises in the gymnasia and in intramural games and also the work of those departments giving instruction in the field of nutrition and dietetics. Since our college campus was quite neglected by the local public health department, it was necessary to organize a college department of sanitation directly under the student health service.

In this co-ordinated group, the student health department has been forced to take the leading rôle and develop the unifying ideals. This is proper, of course, since the physician alone has the training and experience that would enable one to evaluate the factors necessary to maintain the normal physiology of the human body and to detect the early appearance of pathology.

Thus, at the University of Tennessee, in little over a decade, a movement beginning as an attempt to render better medical care to sick students has expanded until the entire student body is embraced in its program. Moreover, the major objective has become the positive promotion of health through a definite educative effort on the part of several co-operating college departments. It must be obvious, I believe, that the significance of student health service is much greater than the maintenance of good health among a few thousand college students. It is having and must have a very wide social effect by the emphasis that it places upon the importance of good health. Its greater contribution to social welfare, however, is its insistence upon the fact that individuals and communities do not have to trust entirely to fortune for health, but, in a very considerable measure, may command good health by the development of a positive and vigorous will to be well.

While we take pride in the progress of student health service in our university, we recognize that some important activities have not yet been inaugurated. At the earliest possible date we should like to start a department of mental hygiene. Here again the obvious need is the care of a considerable number of students who are mentally abnormal. Undoubtedly, however, such a department soon would pass into the field of promoting mental health. An understanding of sex physiology is essential to a course in mental hygiene. The physical, psychological, and social consequences of dodging sexual problems and of "letting nature take her course" in a highly unnatural social organization are too grave to be passed over. We must go further in developing objective, scientific instruction in this field.

The foregoing account of the development of student health service refers to the Knoxville Division of the University of Tennessee. The College of Medicine is located at Memphis, over four hundred miles distant. Associated with it are the College of Dentistry, the School of Pharmacy, and the School of Nursing. Student health service in the Memphis Division has developed independently. On account of the physical isolation of the medical college group, our experience may serve to illustrate the advantages and the disadvantages met with in attempting to develop student health service in a college of medicine.

The initial step, as I have pointed out, is the provision of medical care for sick students. The medical college always is connected with a large hospital that must be well equipped. The college faculty is composed of specialists in every field whose services are available. A student health service, at once and with minimum effort and cost, can provide the best possible medical care for sick students.

As the service passes into the second stage, that of trying to detect illness at its earliest appearance by means of a periodic health examination, the medical college offers even greater advantages. Obviously, there will be available an extraordinarily competent staff of specialists to make the examinations. The physical examination can be extended by supplementary laboratory examinations making use of the equipment and technical staff of the hospital. Through the faculty and the infirmary of the College of Dentistry, a thorough and complete examination of the oral cavity can be added. Altogether, the physical examination can be carried to an extreme degree of refinement and the likelihood of discovering abnormalities very early is improved greatly.

It is when the developing health service passes into the third stage and undertakes to inaugurate a broad and thorough-going program of prevention that serious difficulties present themselves. In extending medical care to the prevention of contagious diseases there is, of course, no trouble. Indeed, it is possible to extend the routine tests and preventive procedures further than is practicable in other colleges. The heart of the preventive effort, however, lies in its educational program—the serious, continuous, concerted drive to alter the attitude of students toward health, to give them an understanding of the basis of health, but, especially, to induce in them a habit of thought that will consider good health something that can be achieved.

The core of the educational effort of the student health department in other colleges is the course in hygiene. Such a course is not suitable in a college of medicine. Through other departments the students are trained thoroughly in the fundamental scientific subjects which constitute the basis of health. In other colleges, the precepts of the course in hygiene are exemplified through the activities of the departments of physical education, home economics, and sanitation. Excepting the work in sanitation, these important auxiliary departments are not represented in the College of Medicine. Even when the medical college is on the same campus with the arts college, the medical student, on account of his greater maturity, his heavy class schedule, and his preoccupation with his professional course, is quite isolated from the general stream of student activity. These factors constitute a serious impediment to the chief purpose of student health service.

The ends sought, however, are too important and too far-reaching to be surrendered without a struggle. Let me venture to suggest that instead of the course in hygiene the medical college should give a course in the social responsibility of the medical profession. The purpose of such instruction would be to give concrete expression to general ideals and practices already characteristic of the profession; to state specifically that the medical profession not only assumes the responsibility of caring for those that are sick but also of instigating, fostering, or directing all activities designed to prevent disease and to promote and maintain good health. Coupled with this course, giving it point and immediately practical application, should be the examination by the students of considerable numbers of supposedly well people. Preferably, this should not be the examination of one group of students by another but rather the periodic examination of such a group as the employees of a large industrial plant.

The second serious impediment lies in the fundamental tradition and philosophy of the medical profession. Although the physician is conscious of the importance of preventive medicine, practically all of his energy still is absorbed in the care of sick people. An outstanding feature of medical tradition is the intensely personal relationship and loyalty between the physician and his patient. The point of view and the objectives of student health service, when fully realized, are preponderantly those of preventive medicine. Although it is concerned in part with students as individuals, to a greater extent it seeks to promote sanitary and social conditions that are conducive to good health for the students as a whole.

Since the difficulty here lies in the habit of thought of an ancient profession, it will be hard to overcome. The most hopeful approach to the problem seems to be through the promotion of the periodic physical examination as a routine part of medical practice. While this is preventive medicine, it is prevention as applied to the individual and does not break too sharply with tradition. It is not necessary to depend entirely on altruistic motives. The periodic examination itself would entitle the physician to additional fees and it would disclose many incipient abnormalities now entirely overlooked and outside of his practice. From this beginning, it may be hoped that the physician's attitude toward health may be changed in time.

In conclusion, it seems clear that, while the development of student health service in a college of medicine is facilitated greatly in its early stages, it definitely is impeded in seeking its fulfilment in its most valuable final stages. However, if it is to become effective as a positive force in promoting general good health and a major factor in developing national well-being and morale, it must complete itself as a part of the educational program and reach into and modify the habits and thoughts of medical students. On account of his superior knowledge of health and disease, the physician is the natural leader in every community in the promotion of health. He is generally a man of prestige and influence. He must be so trained that he will co-operate with other health agencies and guide them in the interest of the public welfare.

Endocrine Therapy in Gynecology

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THIS paper is concerned only with the use of endocrine products in diseases peculiar to women, and the only products with which I have had sufficient experience to justify an opinion are those derived from the ovary, and directly or indirectly from the anterior pituitary.

To discuss endocrine therapy at the present time, one has supposedly to be more or less reckless by nature, and yet, the only way we shall ever make progress in the treatment of endocrine disorders is to acquaint ourselves as fully as possible with the demonstrated physiological effects of the different endocrine products in animals, to use these products in humans wherever they seem to be indicated, and carefully to

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observe and record the results. It is in this spirit that I am reading this paper today. I am fully aware that much, if not all, that I say will be subject to revision as our knowledge of the subject increases.

The known glands of internal secretion are the gonads, the suprarenals, the thyroid, the parathyroids, the thymus, the pineal, the pancreas, the pituitary, the liver and the mucosa of the lower part of the stomach and of the upper part of the small intestine.

Our knowledge of the physiology of these glands is not yet complete, but anatomists, physiologists and biochemists have made remarkable progress in the last decade, and the future holds promise of even greater progress.

The anterior pituitary is the most dominating of the group. It is known to secrete hormones which stimulate the mammary glands, the thyroid, the parathyroids, the suprarenals, the gonads and the osseous system, while another hormone inhibits the secretion of insulin. In turn, its action is inhibited by the ovaries and probably by other endocrine glands as well.

The ovaries secrete two hormones which stimulate the accessory genital organs, namely: progestin or corporin, and theelin. The latter stimulates the endometrium to the development of the interval or proliferative stage of the sexual cycle while the former continues the development of the endometrium to the secretory or menstrual phase. These facts must be borne in mind when administering ovarian extracts for menstrual disorders due to endocrine dystrophy.

In connection with treatment, the most important thing to remember is that no endocrine medication should be given unless we are reasonably certain after careful examination that the disturbance in question is due to an endocrine disorder. This examination should include a careful history, a careful and competent general and pelvic examination and in cases of abnormal and excessive menstrual bleeding, a uterine curettage. When sources of the disorder, other than endocrine, are ruled out, the next step is to take a basal metabolism test.

Certain causes of endocrine disorders should be treated by surgery, as for example, pituitary tumors, Graves' disease, hypernephroma and ovarian tumors including cysts.

Whenever possible in medicine we make a diagnosis before we prescribe. It must be admitted, however, that there are some human ailments, the cause of which is at present unknown. These we have to treat symptomatically or with so-called shotgun prescriptions. Purely endocrine disorders have been to a large extent in this class.

Probably the commonest condition with which the practicing physician is confronted is a disturbance of menstruation. To determine which gland or glands is responsible for this condition is frequently difficult and often impossible. However, we should consider the known endocrine disorders which may be the cause of this symptom. A partial list is as follows:

1. Cretinism, myxedema, mild hypothyroidism, and mild or severe hyperthyroidism.
2. Hypernephroma and pathology of the suprarenals, such as Addison's disease.
3. Tumors of the pineal gland.
4. Tumors and hypofunction of the parathyroids.
5. Diabetes.
6. Dwarfism, Simmonds' disease, gigantism, acromegaly.
7. Ovarian tumors, such as cysts, sarcomata and carcinomata; infection of the ovaries; surgical removal of these organs in whole or in part; and previous hysterectomy.
8. Pernicious anemia.

Most of these conditions can be diagnosed by history, physical findings and laboratory tests, and the treatment, if any, is well known.

In addition to these better known clinical entities there are other endocrine disorders much more commonly seen and much less readily defined, and it is to these that I wish especially to refer. The symptoms and signs, though they differ in degree, are fairly constant in all patients.

Menorrhagia, metrorrhagia, "skipped" periods, oligomenorrhea and amenorrhea are the most outstanding signs. Apparently any one of these signs may be due to the same endocrine abnormality. At least it responds to the same endocrine therapy. Other signs and symptoms that may appear in almost any combination or degree of severity are irritability, easy fatigability, psychoneurosis, loss of weight, abnormal gain in weight, a basal metabolic rate that is below minus eight or above plus eight, acne, especially at the time of menstruation, subcutaneous hematomata without trauma to the part affected, anorexia, difficulty in concentrating mentally, intense sex desire or a total absence of any feeling for association with the opposite sex.

The occasions when some combination of these symptoms may be met are as follows:

1. Postpartum: In my experience, the younger woman with a city background is much more likely to have an endocrine disturbance postpartum than is her sister of the rural community. This disturbance may take the form of amenorrhea for seven, eight or nine months after delivery, even though she has not nursed her baby for some months previously. It is in fact the mother whose milk supply is insufficient for the baby's needs that is the most likely to have this difficulty. In such cases the woman may feel that she is about

to menstruate. That feeling persists for days or even weeks, but no menstrual discharge appears. Meanwhile, she is extremely nervous, irritable and tired. Weight may be satisfactory, hemoglobin may be essentially normal, appetite may be fair; yet the patient does not feel right. She often expresses the opinion that she would feel better if she could menstruate. In such cases the basal metabolism is usually subnormal, that is, it is, at least, below minus six. In the past we have been inclined to consider minus ten as normal, but from a gynecological point of view it is decidedly abnormal and will give rise to abnormal signs and symptoms in a majority of women. Patients who thus fail to menstruate spontaneously may sometimes be successfully stimulated by the administration of quinine or ergot or both. In my experience, however, effective and permanent relief is much more likely to be obtained by a few injections of appropriate endocrine extracts.

2. Endocrine abnormalities are always present during the change of life. While some signs and symptoms are almost uniformly present, others differ markedly in different patients. In most of the patients on whom I have taken a basal metabolism test, I have found the rate to be elevated. Yet in a minority of cases the basal rate is found to be subnormal. It is frequently stated that hyperthyroidism is more likely to appear during periods of physiological and psychological stress, and the menopause is frequently mentioned as one of those occasions. This is undoubtedly true. However, I am convinced that some of the cases of hyperthyroidism seen at this time, and possibly some that have been treated by removal of part of the thyroid, are not primary and permanent diseases of the thyroid gland but are transient conditions due to temporary imbalance of the endocrines precipitated by functional deterioration of the ovaries. In such cases I have used A. P. L. or theelin or usually a combination of both. In most cases this gives marked relief of symptoms while the glands are becoming re-adjusted. It is surprising to find how some of these cases with every evidence of hyperthyroidism, including a basal metabolic rate of plus 70 will quiet down under endocrine treatment and finally become perfectly normal when glandular re-adjustment has taken place.

3. A common time for endocrine disturbances is during the first ten years of menstrual life. In some cases the periods will be regular for a few months after which they will become scanty and irregular. In other cases the periods will be abnormal from the start. In this connection it should be said that the more abnormal the condition the less satisfactory the response to endocrine therapy. The pathology behind the symptoms determines the prognosis. The true rudimentary uterus will not respond to any medication. On the other hand, the prognosis in the case of a pubescent uterus is favorable even though the patient may have menstruated little or none up to the age of 16. In many cases a "skipped" period is due to a decline in general health, and this factor must always be taken into consideration. In my experience, however, this cause is relatively rare. Endocrine dysfunction is almost invariably the condition requiring attention.

To illustrate instances of this type, I might cite a case which I treated with anterior hypophyseal extract five years ago. I had not seen her since treatment until about a week ago. Her story was that as a result of the therapy, her periods remained regular and her health in excellent condition for over two years, when the first thing she noted abnormal was a lessening of the menstrual flow. Over the next six months the flow continued to diminish until it lasted for only a day. By that time her symptoms were the same as when I had first started to treat her. These are the symptoms already enumerated as associated with this condition. She then sought medical relief and her symptoms were attributed to a focus of infection. Accordingly, her gall bladder, appendix, sinuses and teeth were thoroughly investigated and her tonsils removed. However, her signs and symptoms persisted. Proper endocrine medication will undoubtedly restore her to a normal menstrual life and her signs and symptoms will disappear. It may be that the effect will not last beyond two years, maybe not beyond six months, when she may again need a few injections.

A very profuse flow due to glandular derangement is much more difficult to treat than a scanty flow. More prolonged and more frequent treatment is necessary in the cases that I have observed. However, I have a few cases in which bleeding from scanty to profuse was almost continuous for two years or longer, whereas after treatment the patients have had practically normal periods for eighteen months.

Sterility is a condition with which we are frequently confronted. I have had two cases where the patients became pregnant on administration of anterior hypophyseal extracts after all other methods of treatment had failed.

I have had little experience in the use of prolactin in cases of deficient mammary secretion. Where I have used it, I believe that the milk supply has been temporarily increased. However, the price, the quantity necessary, and the uncertainty of its effect on other organs have made me hesitate to use it extensively on private patients. Of the use of cortin in gynecology I have had no personal experience. I have had no cases where, in the light of our present knowledge of the physiology of the endocrines, its use has seemed to be indicated.

In this paper I have not attempted to review the literature. I have given you only my own experience. However, there are many individual physicians, and also some active gynecological clinics that have had results similar to my own.

I feel that we have here an unlimited field for clinical investigation; and the reasonable place for this work to be done is in our charity clinics where material is abundant and therapy inexpensive.

Further Observations on the Relationship Between Herpes Zoster and Chickenpox

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IN THE JOURNAL-LANCET of March 1, 1935, I reported six cases of chickenpox in children following exposure to herpes zoster in adults. At that time, the literature covering various aspects of the relationship between these conditions embraced 200 items. Strange to say, however, only 17 of these were of American origin and only one was from Canada.

Since then, I have found seven more references, all foreign. Of the 17 American references, four were from Minnesota. The first one was a report of a case by Dr. Riggs; the second one was a discussion by him of the connection between the two conditions; the third and fourth references were cases reported by me. It will be seen, therefore, that Minnesota has furnished approximately one-fourth of the entire American literature on this subject.

That there is a definite relationship between these two conditions cannot now be successfully denied, although there are many physicians who, because they have never seen any such relationship, are loath to believe in its existence.

A larger group includes those who have not heard of the matter. This is not strange, for it is only within the last few years that the text books have mentioned the subject. Even now some of them ignore it or make very timid reference to it. However, Andrews, in his 1930 book, devotes a long paragraph to it. Ormsby, in his 1934 edition, mentions the connection and furnishes several footnote references to it. The most outspoken text book reference I have seen is in the 1929 edition of Garrod, Batten, Thursfield and Paterson's "Diseases of Children." This is an English book and Great Britain has furnished many of the reports found in the literature. I quote from this book: "Although in the large majority of cases no such association can be traced, so many examples of this relationship have now been published that there can be no doubt of the close connection between these two complaints!"

Leaving aside the experimental work which is being done to show the *why* of the connection, the real proof that it *does* exist must come from the observations of general practitioners, and especially from those located in more or less isolated country districts where the possibilities of contact with chickenpox itself can be eliminated with a large degree of certainty. The larger towns and the cities afford too many possibilities of contact to furnish really authentic cases.

I now wish to add to those I have already reported two more cases, making a total of eight. With the exception of a case originating in North St. Paul but reaching fruition in Mankato, all of these cases have been seen in or near North St. Paul. If, in the last eight years, I have seen eight cases within the circumscribed limits of my practice, then it is fair to assume that many hundreds of such cases are occurring in other sections of our state and country.

On February 27, 1936, Mrs. S. had what she thought was a cold in the head. A neighbor child, Mary R., 14 years old, went over to stay with her. The child was in contact with Mrs. S. for a part of two days. Living with Mrs. S. was a young man of 22, a relative. Two days after the first symptoms were observed, Mrs. S. developed a vesicular eruption over the right side of the scalp and forehead. On March 2, she called me to see her. She had a herpes zoster in full bloom. I asked about any exposure of children and then learned of the R. girl and of the young man who lived with her.

On March 12, 1936, 14 days after Mrs. S.'s first symptoms, both the young man and the girl developed chickenpox. The girl is one of eight children, none of whom has had varicella. All of them developed chickenpox, four after an incubation period of 15 days, and one each after 16, 18 and 19 days. This is interesting from the standpoint of the incubation period, which is usually given as from 12 to 14 days. My own observation, covering a large number of cases over a good many years, has caused me to believe that 13 days is the most common incubation period. To forestall criticism, I may state that I made diligent inquiry as to any other contact on the part of both the young man and the girl.

The Tropical, or Oriental, Rat Flea, Xenopsylla Cheopis Established in Minnesota

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IN RECENT years the so-called tropical, or Oriental rat flea, *Xenopsylla cheopis* Rothschild, has figured much in medical literature. Not only is it known as the most efficient carrier of bubonic plague, but it has been demonstrated to be a vector of endemic, or murine, typhus in the United States and in other countries. It is one of the several insects serving as intermediate host of the tapeworm, *Hymenolepis diminuta*. Its importance in disease transmission is accentuated by the readiness with which it feeds on man in the absence of its rodent host.

Xenopsylla cheopis has often been reported as occurring on rats in the port cities of the United States, whither it has been brought by ship rats. Indeed, Fox and Sullivan, 1925, found it the predominant flea every month of the year on New Orleans rats. In spite of the ease with which rats are transported from place to place, there has been a general opinion that the Oriental flea in this country is limited to port cities and that even in such places there is no danger of its becoming established in the North. As late as 1934, B. H. Waldron stated "This species has been taken in New York City, but it has not become established in sections where there are long periods of freezing weather."

However, in 1924, F. N. Wallace, State Entomologist of Indiana reported finding *X. cheopis* on rats in Indianapolis, but notes that no infestation of houses by this flea was observed. About the same time the writer identified a specimen from a St. Paul rat.

A most significant situation was reported by Raudebush and Becker, in Science, Aug. 27, 1934, for Ames, Iowa. In February, 1934, they took a specimen of this flea from a rat shot on the city dumping ground, and from six rats shot there in July, of the same year, 257 specimens of the same species were collected.

These instances would suggest that *Xenopsylla cheopis* is probably well established in at least the north central United States, but they have not come to the attention of medical men. A much more striking illustration of the possibility of this flea becoming of medical importance in the North came to our attention this summer and is being reported elsewhere by a graduate student, W. B. Owen. In July of the present year, workers in the dairy barn, on the Farm Campus of the University of Minnesota, at St. Paul, complained that they were being annoyed by excessive numbers of fleas. Specimens were obtained and to our surprise they proved to be typical *X. cheopis*. They not only occurred in numbers on the floor and in the hay but they were the dominant, if not the only, species found on several barn cats.

On investigation it was learned that the barn had been overrun by rats during the past winter and that the cats had been introduced to eliminate the rats. They had succeeded either in doing this or in scaring them off.

A thorough clean-up, including an over-enthusiastic treatment with a creosote dip which killed the cats, served to get rid of the fleas. Desiring to see whether this was an isolated focus, we subsequently, Aug. 18 and Aug. 27, examined 45 rats from two widely separated city dumps in St. Paul. One lot of 30 rats yielded 330 *Xenopsylla cheopis,* an average of 11 each. Individual records were not kept of the remaining 15 but it is believed that each contributed to the 40 specimens of this same species recovered.

It is doubtless true that infested rats have frequently been brought to the Twin Cities by river traffic as well as by rail but it is clear from the records here given that the Oriental rat flea has become well established in the North, in spite of our severe winters. In case a plague-infected rodent should chance to be brought in, the stage is set for the establishment of the infection among our local rats and for human cases, as well.

Little thought in this country has been given to the possibility of this extension of bubonic plague. Like its most important vector, the disease is usually regarded as an exotic one, rarely introduced, and held in check at the ports of entry. Even the spread of the infection to the ground squirrels of California, has aroused little interest except on the part of those medical and public health men directly concerned with its control. It is not generally known that each year a number of plague-infected rats and ground squirrels, and sporadic human cases are reported from our West Coast.

Some recent developments have shown that foci of infection exist far from those previously recognized. For several years past there have been reports of an epizootic disease among ground squirrels in Oregon and Western Montana. In 1935 it was definitely determined by workers in the Public Health Service that this disease was bubonic plague. During the present year additional foci have been found among ground squirrels of Idaho, Nevada, and Utah. Ground hogs, or marmots, have also been implicated. Dr. Eskey, of the Public Health Service, has reported that lice and fleas from Montana ground hogs were infective and that a plague-sick ground hog was killed July 31, 1936, in Beaver County, Utah. More recently a fatal epizootic among prairie dogs in Utah has been found due to plague. A human case is reported from Utah and one of doubtful diagnosis is under observation in Montana.

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†Professor of Entomology, University of Minnesota.

How much further eastward this infection is already established among rodents and when it may extend into densely populated regions, no one can know. Once in the neighborhood of cities and with spread from ground squirrels to house rats, serious outbreaks of human plague might readily occur.

Gastric Tetany*

Case Report

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Tetany is divided into two classes: (A) The tetanies of calcium deficiency, and (B) The tetanies of alkalosis.

(A) The tetanies associated with a lowering of the blood calcium are as follows: (1) Hypoparathyroidism, (2) Infantile tetany associated with rickets, (3) Tetany of pregnancy, (4) Tetany occurring with osteomalacia, and (5) Tetany of uremia.

In infantile tetany, tetany associated with osteomalacia and the tetany of pregnancy, there is a deficiency of vitamin D; or a deficient intake or excessive loss of calcium.

(B) The tetanies of alkalosis include: (1) Pulmonary hyperventilation, decreasing the carbon dioxide tension of the body, (2) Excess of sodium bicarbonate or alkaline phosphates, and (3) Gastric tetany, due to loss of hydrochloric acid.

In these conditions an alkalosis is present as a result of either a decrease in carbon dioxide tension or an increase in bicarbonate.

Gastric tetany is an expression of a disturbed function of the acid-base equilibrium of the body. It is not a disease entity. It is definitely associated with an alkalosis brought about by the continuous removal of hydrochloric acid from the stomach, either by persistent vomiting or by marked dilatation of the stomach from pyloric occlusion. In either condition the mechanism is one in which there is an increase in the blood bicarbonates or a decrease in the hydrogen ion concentration. Alkalosis is the result.

In its general symptoms it resembles other forms of tetany in the development of excessive irritability of the motor nervous system, but is fundamentally different in that it is not produced by a lowered blood calcium. In gastric tetany the loss of chlorides is the primary disturbance in the plasma electrolyte balance.

The following illustrates the foregoing statements regarding gastric tetany.

On October 18, 1935, R. E., female, age 40, was admitted to this hospital in coma. History given by her husband and later substantiated by her, is as follows:

October 9th, nine days before admission, following some dental work, she suffered intense headache, dizziness, nervousness, and moderate generalized stiffness. Seven days later, October 16th, she developed muscular spasms and twitching of the entire body, with nausea and vomiting. She was removed to a Los Angeles hospital where the diagnosis of "tetanus" was made, and during her first 24 hours at that hospital she was given 56,000 units of tetanus antitoxin. The following day she developed convulsions with persistent vomiting, and slipped gradually into coma. Following a consultation she was transferred to this hospital with a diagnosis of (1) gastric tetany, (2) hypoparathyroidism.

A negative allergic family history fairly well removed the tetanus serum as the etiological factor in the production of her coma. Her personal history was negative except for diphtheria and typhoid fever, both during her twelfth year. She is the mother of two children, ages 20 and 14. Her menses began at the age of 13 and have always been regular.

Physical examination revealed an obese, well developed comatose woman, with generalized spastic convulsions. Temperature was 102°, pulse 88, respirations 20. Pupils were pin points; corneal reflexes absent. Rigidity of the neck was four plus. Marked lockjaw obtained.

Her heart and lungs were normal. Blood pressure was 130/70. Abdomen was distended and board-like. Knee jerks and ankle clonus were markedly hyperactive. During the convulsive attacks there was marked arching of her back and neck—a decided opisthotonos. The convulsions occurred every few minutes, being precipitated by the slightest external stimulus.

*Laboratory Findings:**

The white cells, 27,300, Pmns. 97 per cent.

Non-protein nitrogen, 44, 25 to 120 per cent above normal.

Urea nitrogen, 25.4, 60 to 150 per cent above normal.

Serum calcium, 8.6, 10 per cent below normal.

Uric acid, 3.4, which is a high normal.

Blood sugar, 156, 100 per cent above normal.

Carbon-dioxide combining power 62.6, which is within normal limits.

Diagnosis:

Gastric tetany from alkalosis, secondary to pylorospasm (Hypoparathyroidism a factor).

Her serum calcium was only slightly out of balance. However, this did adjust itself with correction of the alkalosis. This calcium deficiency was attributed to lack of calcium absorption from the intestine. The amount absorbed is increased when the calcium is present in the bowel in a more soluble form. Thus, when the acidity of the small intestine is increased, acid calcium phosphate is formed and more absorption occurs. Conversely, increased bowel alkalinity produces insoluble tricalcium phosphate and calcium carbonates. Therefore, less absorption takes place.

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*In competition for Intern Prize, June 2, 1936. (Won second place.) From John W. Shuman's Service of Internal Medicine, Hollywood Hospital.

*Obtained 24 hours after treatment had started; we erred in not obtaining the P_H and chlorides of the blood.

Comment

A stormy week followed her admission to this hospital. Findings at various times were bizarre. The convulsions would recur upon slightest provocation, for example, the sight of a hypodermic needle. Improvement was not consistent. At times she exhibited definite hysterical manifestations.

Results from the use of calcium salts, ammonium chloride and normal sodium chloride given by the usual channels were encouraging. She was not neglected with atrophine, codeine, carbogen and hot mustard packs. In a few hours after her admission she had changed from a person critically ill to one in fair condition. Her convalescence was fairly uneventful and she was discharged two weeks after admission. She walked to her car.

Differential Diagnosis:

Several conditions resemble gastric tetany.

(A) Tetanus: While a syndrome very similar to tetany may occur in this disease, the absence of the typical tentany signs, Chvostek's and Erb's phenomena, usually permit an easy differentiation between tetanus and tetany.

(B) Strychnine poisoning: The spasms of strychnine poisoning come on more suddenly, attack by preference the muscles of the extremities, and are separated by intervals of complete relaxation. Risus sardonicus is marked. Strychnine poisoning is quickly followed by death, or recovery.

(C) Hydrophobia: In hydrophobia the muscles of deglutition are usually paralyzed, and there is a history of the bite of a rabid animal.

(D) Hysteria: Hysterical convulsions may simulate tetany very closely but the characteristic phenomena, together with lowered blood serum calcium and alkalosis, are not found.

(E) Other conditions which offer little, if any difficulty of differentiation, are tuberculous and epidemic cerebrospinal meningitis, epilepsy, eclampsia and poliomyelitis.

Treatment

Treatment of gastric tetany consists of combating the alkalosis. The administration of such acidifying salts as calcium and ammonium chlorides produces immediate relief from the acute tetanic seizures. The favorable reaction depends upon an increase in the hydrogen ion concentration of the blood and is proportionate to the degree of acidosis produced.

Vomiting must be combated in order to stop the dehydration and further loss of hydrochloric acid. Gastric lavage is contraindicated.

BOOK NOTICE

THE ROCHE REVIEW

The Roche Review, edited by LOUIS KLEIN, M.D., and others: monthly, smooth enamel paper, illustrated, indexed, pagination varying; Nutley, New Jersey: Hoffmann-La Roche, Inc.: 1936. Gratis to physicians.

Volume One, Number One, of the new *Roche Review* has just been issued. It is edited by Louis Klein, M.D., whose assistants are Ralph D. Shaner, M.D., and Michael Schubert, M.D., and is printed on smooth enamel paper with pleasing halftone illustrations. The abstracts in general are good and timely, and the journal has copious bibliographies. Maurice Chideckel, M.D., the famous sexologist of Baltimore, Md., has a regular monthly department, entitled "Leaves from a Doctor's Diary." There is an interesting section called "Medicine in Art." This informative little medical journal is sent free to any physician who wishes it. It may be had by addressing Hoffmann-La Roche, Inc., Nutley, New Jersey.

A FAMOUS CLASSIC RE-EDITED

An Analysis of the De Generatione Animalium of William Harvey, by ARTHUR WILLIAM MEYER, B.S., M.D.; first edition, heavy grey paper dust jacket, stiff boards, paper binding, 153 pages plus bibliography and index, illustrated; Palo Alto, California: The Stanford University Press: 1936. Price, $3.00.

The author, who is professor of anatomy in the Leland Stanford University School of Medicine, makes an interesting point in telling why he wrote this book: there have been 144 Harveian Lectures in London alone since Harvey's publication of this work 284 years ago; yet the original work itself has never been accorded extended criticism or analysis, not even by the Harveian lecturers. In many instances, it has even been ignored.

The book itself is very competently done. Professor Meyer has examined many sources and obviously assured himself of the veracity of each. His picture of the times in which Harvey lived is particularly felicitous. Evidence abounds to testify that Meyer gained much personal pleasure from his study of the mass of material represented in this work.

Physically, the book is handsome. It is printed on laid paper in an Old Style face, with steel engravings *(fac similes)* on linen stock. The frontispiece is from the Jansson edition of Harvey.

FICTIONIZED PHYSICIAN

The Doctor, by MARY ROBERTS RINEHART; first edition, 506 pages, no illustrations; New York City: Farrar & Rinehart, Inc.: 1936. Price, $2.00.

A favorite theme these days is the life story of a doctor. The stage, the screen, and many novels, have resorted to it. Now, Mary Roberts Rinehart has attempted it for the second time. *K* was her first, and *The Doctor* is her second, pseudo-medical contribution.

One is afraid, yet hopeful, that physicians will resent this portrayal of Doctor Arden. The author has endowed him with all the fine attributes for which a physician could wish . . . sincerity, ability, skill, humanitarianism, *ad infinitum* . . . in addition to an attractive personality and a pair of fine surgical hands. Yet, in order to create a story and to furnish the usual—or perhaps they are unusual—trials of a fictitious physician, she has made this man a weakling, unable to cope with any situation in his personal life; a butt for everyone, including fate and women. He is, like Brutus, too honorable.

Noel Arden's sense of honor is carried to ridiculous extremes, and instead of sympathy for this buffeted fool, one feels only impatience and disgust. He seems, with all his talents and charm, simply a character created to fulfill a plot. There could be few physicians if they wove their lives as Noel Arden does (and one may unblushingly say the same for honor): the profession would be too great a sacrifice. The people about him are as unreal, and therefore as unimportant, as Dr. Arden.

This is a readable tale of a too, too honorable physician. It is unconvincing and inconsequential—light summer reading for one who does not become *ennuyé* and vexed with absurdities. —J. H.

COMPARATIVE NEUROLOGY

Comparative Neurology, by JAMES W. PAPEZ., B.A., M.D.; first edition, heavy red cloth, gold-stamped, illustrated by PEARL SOWDEN PAPEZ, with 315 drawings, 507 pages plus index (bibliographies following each chapter); New York: The Thomas Y. Crowell Company: 1929. Price, $6.00.

This work has an unusual interest to physicians in this territory because the author, who is assistant professor of anatomy and neurology in Cornell University Medical College, New York City, was born in Glencoe, Minnesota, in 1883, was graduated from Hutchinson High School in 1904, and took his doctorate in Medicine from the University of Minnesota Medical School in 1911.

This is primarily a laboratory course text. It deals with the form, structure, and functional arrangements of the nervous system. The first section deals with the gross structure of the brain of mammals; the second part discusses the microscopic structure of the mammalian nervous system; and the third part analyzes the nervous systems of the lower vertebrates.

THE JOURNAL-LANCET recommends this work. It is felt that some measure of praise ought to be accorded the illustrations by Mrs. PAPEZ, which are clear, forceful, and simple.

PERIPATETIC PHYSICIAN

An American Doctor's Odyssey, by VICTOR HEISER, M.D.; heavy brown cloth, stamped in green and gold, 535 pages plus index, line cuts at chapter headings; New York City: The W. W. Norton Company: 1936. Price, $3.50.

That this volume should become popular is a *fait accompli.* It has been selected by the Book-of-the-Month Club, which is by way of saying that a thumping good number of sober citizens will be privy to its romantic secrets before the year is out.

The choice seems exemplary. Dr. HEISER is certainly entitled to his reminiscences; and their content is such that a fast-moving, sparkling narrative is insured throughout. From the time that young HEISER was pitched into the waters of the Johnstown flood in 1889, to his resignation from the Rockefeller Foundation in 1934, his life was as full of adventure as a first-class fighting man's. He was almost knifed in Italy by a disgruntled ally of the Camorra. He cured the Igorots of yaws with 606 and some small amount of hocus-pocus. He was intrepid enough to go swimming in waters abounding with killer sharks. He knew LEONARD WOOD, HERBERT HOOVER, JOHN D. ROCKEFELLER, GORGAS, and at the last, even HAILE SELASSIE.

Even in the midst of all his exploits, HEISER was first of all the physician, then the diplomat. He had to be. He was a great internationalist in the sense that he espoused the cause of public health in no less than 45 countries, from the loneliest South Sea strand to the reaches of Manhattan Island. His experiences compose a stout volume which any physician would be happy to have in his own private library. The work is therefore highly recommended.

PIONEER PSYCHIATRIST

Recollections of Richard Dewey, Pioneer in American Psychiatry. Introduction by Clarence B. Farrar. The University of Chicago Press, Chicago, Illinois. Price, $2.00.

"He saw America develop from covered wagon to airplane. He had planned to give in the third part of the book an account of his more than fifty years of active practice in psychiatry, of his experience in his profession in its many aspects—scientific, social, legal, and administrative. He had completed the account of but twenty of those years at the time of his death." Thus epitomizes the editor. The current flowering of autobiographies invites no unpopularity through these pleasing "recollections." While written by a doctor, and in some of the vernacular of the guild, the first set of pages introduces Dr. Dewey's pleasing style and pithy analysis of the fundamental urges that have made of those endowed with the gentlest of spirits, the greatest of pioneers.

Dividing his book roughly into four parts, it is likely that his death in 1933, at the age of 88, deprived us of that quarter of the book which, like current history, might well be the least informative and definitive. The first set of pages is priceless. It traces his preparation for life, his ultimate graduation in Medicine. One catches the charm of a self sufficient and cloistered life of early rural New York: the village smithy, his own father's grist mill, the churches and their organs, the community life that saw poverty and hardship, but made a prime business of fortifying against adversity, even as the preceding generations dug in against the scalping Indians. Stuart Chase pleads for a return to this rural self sufficiency, but too many high schoolers of today do not have the chance to serve under a highly trained millwright father or to profit from the guidance of "a firm but just mother."

The next fifty pages concern his activities as an army surgeon, on the side of the Germans, in the Franco-Prussian War. In the light of present-day Europe and the intense internationalism, the product of the Great War, one senses an American aloofness in 1870 that seemed impossible in 1916. In any case, those of us who have witnessed the efficiency of German Medicine in the early years of this century find unusual interest in his comparison of the surgery of his day in New York and that practised among the Germans in that awakening period when the exactitude of Virchow was to have added the safety of Listerian antisepsis. Brushing aside matters of fashion and external approaches, it is evident that neither the Germans nor the French (and possibly the Americans as well) have essentially changed.

Psychiatrists will find in the third section of approximately fifty pages, a very engaging recital of how he pioneered and helped to found the specialty of Psychiatry in the United States. Of particular interest to Minnesotans is the contact Dr. Richard Dewey made on returning to New York with Dr. Edwin A. Kilbourne, the man who was to later come to Minnesota and do so much for our institution for the insane at Rochester. The author relates how he came out to Elgin, Illinois, where he found the public, through its legislators and governing boards and institutions, much more interested in architecture and custodial segregation of the insane than in any worthwhile efforts to readjust the lives of the unfortunate inmates and restore them to useful community life. Dr. Dewey's name has been connected conspicuously with developing what became known as "the cottage system" at Kankakee. The depression of 1893 and a political upheaval in Illinois forced his retirement from the conduct of a state institution to the development of the well known private sanitarium at Wauwatosa, Wisconsin. Here he found surcease from the hopeless struggle of attempting to harmonize scientific efforts with catering to the behests of local politicians. It is evident that in the later years of his life, through his literary knowledge and skill, he did much pioneer work in developing his specialty of Psychiatry, and those particular journals (now the American Journal of Psychiatry) which have done so much to develop for us that fine group of men, in private and public practice, presently advancing the humanitarian effort that began with the Englishman William Tuke and the Frenchman Philippe Pinel. We still look upon insanity as a "thing apart." Doctors and laymen alike should read this gentle booklet. —E. L. Tuohy, M.D., Duluth, Minn.

The JOURNAL LANCET

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MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA and MONTANA

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CLEANLINESS OF BIOLOGICALS

Too often the physician hears "I don't want any of that nasty, dirty vaccine in *my* system." Whatever else may be said about biologicals, they are not dirty. They could not be made without observance of the most scrupulous cleanliness.

Before the advent of bacteriology we were content to require that test tubes and other containers be "chemically clean," and this still suffices for the ordinary drugstore bottle but not so when vaccines and sera are concerned. Here we are dealing with something of a delicate nature and it must be minutely and *microscopically* clean.

Sera neutralize and stem the ravages of disease like water on a fire, while vaccines stimulate resistance to enemy invasion like a bugle call arousing an inactive garrison. Vaccine is not filth; it is antifilth and emphatically so, and we must try to get this across to the public in some simple, understandable language.

Medicine has made such progress that even physicians find it difficult to keep up to the times and we can scarcely expect the laity to co-operate without patient instruction, an opportunity we should not neglect.

A. E. H.

POLITICS

The publication of this will follow our quadrennial trek to the polls. It cannot, therefore, be said to have incubated with this specific election in mind. Our guild traditionally treasures the opportunity to eschew all class distinctions. Political campaigns should not divert us from this allegiance. We defy our best traditions when we consciously or unwittingly, not to say exuberantly, ally ourselves with any movement or group dependent for its existence upon the establishment of class consciousness.

Current history all too clearly portrays to what extent antagonisms and even bloody warfare may usurp human effort. The pity is that these violently opposing groups are all firm in their conviction that they desire only to advance justice and human welfare. It is not that an appeal should be made for innocuous neutrality; we hope that science basically guides us. Science, with the moral and the aesthetic, aims to unfold the truth; and truth, like justice, wherever found, is universal.

Presently, microphoned panacea venders fill the air with voting appeals. Each would arrive at social justice apparently, through a conjunctive association of coercion and physical inactivity. The immediate appeal seems to be to give everyone at the banquet table of success a reserved seat. Most of this is just plain "eyewash," and it makes little difference from which bloc it comes. As with Liebig's chemical diet (all men needed to live), those who tried this found such a price of life too dear. Liebig left out so many "non-essentials" that no patrons cared to live. The famous chef in a nearby Gast Haus showed him up miserably. This chef had been inspired by traditions and precepts and had a great love of the art. No one really suffered by submitting his G. I. tract to his tender ministrations. Politically and economically we may be in the "raw meat-and-nut age," but has anybody any real zest for the substitutes offered where the plethora of cooks all too plainly hints at a product that is likely to be a murderous broth. E. L. T.

THREE GREAT G MEN

Surgeon Generals Charles R. Reynolds, P. S. Rossiter, and Thomas Parran of the Army, Navy, and Public Health Service, speaking on "Medicine in Modern Military Operation," "The Naval Medical Reserve Officer," and "Public Health Today," at the dinner of the International Medical Assembly of the Inter-state Postgraduate Medical Association of North America in St. Paul on October 14th, not only gave masterly accounts of themselves in their respective fields, but showed a commendable understanding of the problems of physicians in civil life.

Dr. Parran said that specialization tended to compartmentation and separation of medicine. He warned that there is danger of being too interested in one's specialty. He advised the need of looking up from the microscope and viewing the whole problem with a telescope. He was firmly convinced that health problems could best be worked out by each community and that the National Health Service should step in only when it became necessary to enforce such measures as the local authorities were unable to perform. He summed up the duty of public health in "The application of biologic knowledge to improve man and adapt man to it." We pass these thoughts on for the benefit of those who were unable to be present. A. E. H.

THE DELICATE CHILD AND TUBERCULOSIS

The observations of Ward (Brit. Jour. of Tuberc., 29: 128, 1935) made over a period of twenty-one years have resulted in almost identical findings as those made in this country. Twenty years ago and even less, we were emphasizing the delicate child as the future consumptive. We strongly recommended summer camps, special schools, and preventoria, in the hope that we could prevent these children whom we believed to have low resistance, because they appeared delicate, from becoming tuberculous. In fact, we placed great stress upon the child whose weight was 10 per cent or more below the theoretical normal. The years have shown, however, that these children are no more likely to develop tuberculosis than apparently normal healthy children and, therefore, our program of coddling them from the standpoint of preventing tuberculosis has collapsed.

Ward calls attention to observations made in Lancashire, which showed that "the frail children grow into frail but non-tuberculous adults, whereas the young adult and adult cases of florid or more chronic tuberculous disease come, alas! from among the apparently healthy children." The aim of the observations in Scotland, published by McKinlay and Watt (Lancet, Aug. 11, 1934), was to determine whether by routine clinical examination it was possible to predict the type of child likely to become tuberculous later. Height and weight gave no clue as to those who would later become consumptive. They found that those children who had had the various communicable diseases of childhood were no more likely to develop tuberculosis later than those who had not, with a possible exception of scarlet fever. Observations on external conditions, such as insufficient clothing, dirty clothing, clean heads, nits, clean bodies, and flea-bitten bodies, suggest that those with dirty clothing and dirty heads later develop tuberculosis more frequently than others. Since these are outward indications of a poor environment, where, if an open case of tuberculosis exists, contact with that case is unavoidable, such a finding is to be expected.

Ward calls attention to the fact that a delicate child may develop tuberculosis, but that precautionary measures which may be carried out to the extreme do not necessarily prevent it. He cites a case of a boy of ten years who had always been delicate but clinical and x-ray examinations were negative. However, in 1928, he was exposed to a brother who died of tuberculosis. This boy was immediately sent to a children's sanatorium because of the exposure. He remained there two years and three months. When he completed school he went to work, but in 1935 he had bilateral upper lobe tuberculosis. On the basis of the evidence available, Ward says "that sooner or later we shall be driven to conclude that the debilitated child is just as likely, no more and no less, to develop young adult or adult phthisis as the robust or normal schoolboy."

Evidence based on such observations from various parts of the world impress us with the fact that tuberculosis is a communicable disease and that the delicate child who does not take tubercle bacilli into his body will not have tuberculosis but that any child, whether he be delicate or robust, who is permitted to be exposed and infected with tubercle bacilli, is in considerable danger of developing the disease some time in adult life. With such facts established, we should immediately discontinue some of the tuberculosis work of today, and re-establish it on the fundamental principles that we have used in other communicable diseases. J. A. M.

HARPER M. WORKMAN, M.D.

In the passing of Dr. Harper M. Workman, the medical profession of Minnesota loses one of its most loyal supporters.

During his nearly thirty years of chairmanship of the Minnesota State Medical Council, he missed but few meetings, although it meant great sacrifice for him to attend. Less than one month before the end he attended the council meeting in St. Paul and made no complaint of his failing condition.

Dr. Workman passed away at his home in Tracy, Minnesota, Thursday, October 8th, after a comparatively brief illness, at the age of 81 years.

Dr. Workman was graduated from Chicago Medical College, 1878. He came to Sleepy Eye, Minnesota, where he became surgeon for the North Western railroad. Later he went to Pierre, South Dakota, to work among the road construction gang. His association with the Indians and Indian history in Minnesota has been the subject of some interesting writings by him.

He was a member of the Lyon-Lincoln County Medical Association, a member of the American College of Surgeons, the State Medical Association of which he was a past president, and a fellow of the American Medical Association. He leaves one son, Dr. W. G. Workman, with whom he was associated in practice, and one brother, Morris, in Minneapolis.

The faithfulness with which he performed all duties assigned to him by his medical associations and the self sacrifice which he bore in the performance of these duties should serve as an excellent example to the younger men of the profession who must bear these future responsibilities. J. M. Hayes, M.D.

AUGUST EGGERS, M.D.

Again it has devolved upon us to lay away all that was mortal of an honored and esteemed fellow-worker, Doctor August Eggers, of Grand Forks, North Dakota; to make a note of his passing, pay our parting tribute and drape the empty chair.

Dr. Eggers was born at Koginsberg, Norway, Dec. 30, 1862, and passed away at his home in Grand Forks, North Dakota, October 7, 1936. He graduated in Medicine from the University of Christiania, Norway, in 1889. He came to America in 1890 and began practice in Sioux City, Iowa, where he remained for about a year. He then moved to Grand Forks, North Dakota, where he established a permanent residence. During the war he served on the advisory examining board of Grand Forks District. For many years he gave to the medical students of the University of North Dakota a series of lectures with demonstrations on physical diagnosis, that were held in high esteem. He was a member of the local Medical Society and of the State Medical Association, of which later he was elected president in 1897. He was also a member of the American Medical Association and of the American College of Surgeons.

Dr. Eggers was a type of the Old School practitioner that is fast passing—well-trained, scholarly, cultured, dignified, ethical, sure of himself and devoted to his Art. He was an individualist and as such carried a burden that might well have been shared with others. He was a tireless worker, and gave to his patients the best he had of learning, skill, time and energy. Dr. Eggers was recognized among his fellows as a careful, conscientious, and painstaking physician and surgeon. With him there was but one way, the right way, as he conceived it, and that was his great concern. He may have seemed uncompromising at times, but this with him was allegiance to truth; and away back of it all was the great, warm, sympathetic heart of the true physician.

Dr. Eggers was a lover of nature in its rugged aspects. The prairies held little to remind him of the mountains, streams, glaciers, fjords, and waterfalls of his native land that he loved with all the fervor of a patriot. To ease the aching void it was his custom to repair at stated intervals to the Canadian Rockies where he enjoyed to the full the thrills and delights of mountain climbing and allied sports. From these excursions he would return strengthened in body, refreshed in mind, and eager to take up the details of a busy practice. Whether in periods of relaxation, play or work, he always carried with him an independent bent of mind, a methodical way of life, and the mien and the bearing of a gentleman.

Dr. Eggers was a member of the Masonic bodies and was affiliated with the Presbyterian Church. Surviving him are his widow, two sons, Dr. Rolf K. Eggers, of Seattle, Wash., and Leif Eggers, of Los Angeles, California, and a sister in Oslo, Norway.

In the passing of Dr. Eggers the profession of medicine has lost a worthy representative and the community a strong and distinctive personality.

JAMES GRASSICK, M.D.

REPORTS OF SOCIETIES

INTERNATIONAL MEDICAL ASSEMBLY
of the
INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA
ST. PAUL, MINN.
OCTOBER 12, 13, 14, 15 and 16, 1936

Except for the fact that there was a pre-assembly clinic on Saturday, October 10, the 1936 assembly of the Inter-State Postgraduate Medical Association of North America opened in the St. Paul Civic Auditorium at 8:00 a. m. on Monday, October 12. Registration of course occupied much of the first day's hours; but some very important addresses were delivered in the older part of the Auditorium plant during the day. Of interest to Minnesota physicians were the diagnostic clinic of Dr. Waltman Walters, of the Mayo Clinic, Rochester, Minn., on "The Pathologic Physiology of the Common Bile Duct and Its Relation to Disease of the Biliary Tract"; the address of Dr. Jennings C. Litzenberg, professor of obstetrics and gynecology in the University of Minnesota Medical School, on "Obstetric Hemorrhages and Their Treatment"; and an address in the evening by Dr. John S. Lundy, of the Mayo Clinic, and Dr. E. B. Tuohy, of the Mayo Clinic, on "Intravenous Anesthesia." Noted speakers from outside Minnesota on this first day's session were Dr. Hugh Hampton Young, professor of urology in the Johns Hopkins University School of Medicine in Baltimore, Md.; Dr. Emil Novak, associate professor of obstetrics in the University of Maryland School of Medicine at Baltimore; Dr. Robert D. Lawrence, physician to King's College Hospital in London, England; Dr. Frederick A. Coller, professor of surgery in the University of Michigan Medical School; and Dr. Wayne Babcock, professor of surgery in the Temple University School of Medicine in Philadelphia.

By Tuesday morning, the assembly was well under way. Most of the scientific exhibits were functioning entirely, and the physicians in attendance were thronging that part of the Auditorium given over to these exhibits.

As usual, the Mayo Clinic provided a series of very interesting and valuable exhibits. One of these was Dr. H. S. Plummer's, who had provided his findings in regard to the thyroid gland and its disturbances. Another was a complete operative procedure, step by step, for the relief of a hyper-active thyroid gland, offered by Dr. Charles W. Mayo and others. Dr. S. F. Haines and Dr. O. L. Kirklin, of the Clinic, supplied a highly successful exhibit on myxedema; while Dr. C. W. Mayo and Dr. E. G. Wakefield, of the Clinic, were represented by an exhibit on "Disseminated Polyposis of the Colon."

Dr. Horace Newhart, Minneapolis, was in appearance at the Assembly with his exhibits on the nature of work being done for children with hearing loss in the public schools of Minneapolis. Dr. Ralph V. Ellis, a member of the editorial board of THE JOURNAL-LANCET, also presented an exhibit. One of the most popular of all scientific exhibits was that of Dr. L. F. Hawkinson, of Brainerd, Minn., which dealt in some measure with Dr. Hawkinson's experiences with the male and female sex hormones. Dr. Frank E. Burch, St. Paul, was represented by an exhibit of the American Academy of Ophthalmology and Otolaryngology, of which he is president. The University of Minnesota Medical School also was represented in the scientific exhibits.

Other Minnesota scientific exhibitors were: the Minnesota Public Health Association; the Minnesota Association for Crippled Children and Disabled Adults, under the supervision of Miss Jean Pierce and Miss Pearl Kenny; Dr. F. F. Callahan, of Pokegama, Minn.; Dr. Everett K. Geer, of St. Paul; the Pokegama Sanitarium, Pokegama, Minn.; Dr. Rosendahl, of Minneapolis; Dr. H. Longstreet Taylor Foundation, Pokegama, Minn.; and their assistants.

An outstanding scientific exhibit was that of the Wilmer Institute of the Johns Hopkins University School of Medicine at Baltimore, Md.; and also that of Dr. Max Cutler, of Michael Reese Hospital in Chicago, who outlined shortly the dangers of using the same knife for biopsies of malignant tumors and for subsequent operations on normal tissues.

A Minnesota man who spoke on Tuesday was Dr. Owen H. Wangensteen, professor of surgery in the University of Minnesota Medical School, who spoke on "The Management of Intestinal Obstructions."

Dr. Donald C. Balfour, of the Mayo Clinic, and president of the American College of Surgeons, presented a diagnostic clinic on "Carcinoma of the Stomach" at the Wednesday sessions. Dr. Alfred W. Adson, of the Mayo Clinic, offered a diagnostic clinic on "Essential Hypertension"; and Dr. E. V. Allen, also of the Clinic, assisted him. On Wednesday, also, Mr. C. Naunton Morgan, F.R.C.S., senior assistant to Saint Mark's Hospital for Diseases of the Rectum, in London, England, spoke on "The Surgical Anatomy of the Anal Canal."

With Dr. David Riesman, of Philadelphia, as toastmaster, physicians and their wives and guests assembled at the Saint Paul Hotel on Wednesday evening, October 14, to hear Major-General Charles R. Reynolds, surgeon-general of the United States Army, speak on "Medicine in Modern Military Operation." At this banquet Rear Admiral P. S. Rossiter, surgeon-general of the United States Navy, spoke on "The Naval Medical Reserve Officer"; and Surgeon-General Thomas Parran, Jr., of the United States Public Health Service, spoke on "Public Health Today." The gold medal for achievement was presented by the Inter-State Postgraduate Medical Association to Drs. Charles H. Mayo and William J. Mayo, of Rochester. Dr. George W. Crile, Cleveland, Ohio; Dr. Charles G. Heyd, New York City, president of the American Medical Association; and Dr. John F. Erdmann, president-elect of the Inter-State Postgraduate Medical Association, also spoke briefly.

Physicians on Thursday heard Dr. Frank H. Lahey, of Boston, Mass., give his diagnostic clinic on "Indications for Surgery and the Surgical Treatment of Peptic Ulcer." Dr. Hugh Cabot, professor of surgery in the University of Minnesota Graduate School of Medicine at Rochester, offered a diagnostic clinic on "Cryptochordism"; while Dr. Charles H. Mayo, Rochester, Minn., gave an address, "The Present Day Evidence of Surgical Progress." Dr. Claude F. Dixon, of Rochester, Minn., spoke on "Carcinoma of the Pelvic Colon: Resection Without Permanent Colostomy." Mr.

Archibald McIndoe, assistant plastic surgeon at Saint Andrew's Hospital in London, England, spoke on Thursday afternoon on "The Application of Cavity Grafting."

On Friday, the last day of the Assembly, a major diagnostic clinic was that of Dr. Elliott P. Joslin, clinical professor of medicine in the Harvard Medical School, Boston, on "Protamine Insulin." He was assisted by Dr. Priscilla White, of Boston.

Just before the noon adjournment on Friday, Dr. Francis J. Charteris, professor of materia medica and therapeutics at St. Andrew's University School of Medicine in St. Andrew's, Scotland, spoke to the members. In the afternoon, Dr. Walter Alvarez and Dr. Russell M. Wilder, of the Mayo Clinic, were speakers. Dr. Elliott C. Cutler, of Boston, spoke on "Diabetes Insipidus," and Dr. Loyal Davis, professor of surgery in the Northwestern University School of Medicine, spoke on "Neurological Surgery."

The International Medical Assembly ended officially at 6:00 p. m. on Friday afternoon; but there were post-Assembly clinics in Saint Paul hospitals on the following day, October 17.

NEWS ITEMS

Dr. Robert Dyar, who has been in practice at Huron, S. D., has moved to Baltimore, Md.

Dr. K. W. Navin, Mitchell, has moved to Philip, S. D., where he will continue his general practice.

Dr. W. E. Long, Anaconda, Mont., is in Chicago, where he will spend several weeks in postgraduate work.

Dr. Paul R. Scallin, formerly located at Clark, has moved to Redfield, S. D., where he will continue general practice.

Dr. LeRoy Bolton, formerly of Butte, is now located at Deer Lodge, Mont., where he will continue general practice.

Dr. W. F. Cashmere, Jr., has become associated with Dr. B. C. Shearer in the general practice of medicine at Helena, Mont.

Dr. C. E. Sherwood, Madison, has been named president of the South Dakota State Health Officers' Association.

Dr. Phillip R. Burkland, one of the pioneer physicians of Vermilion, S. D., died suddenly at his home in that city last month.

Dr. E. T. Keller, formerly of the Moe Clinic, Sioux Falls, has purchased the practice of the late Dr. C. G. Lundquist, at Leola, S. D.

The new president of the International Medical Assembly is Dr. Elliott P. Joslin, Harvard Medical School professor, Boston.

Dr. W. W. Higgs, Park Rapids, Minn., is spending a few weeks at the Cook County Hospital, Chicago, taking a special course in accident surgery.

A testimonial dinner was extended to Dr. G. B. Weiser, New Ulm, Minn., by his many friends, in honor of having passed the half century in practice in that city.

Dr. H. T. McGuigan, Red Wing, Minn., who has been seriously ill for several months, is back at his office and tells his many friends that he is now in the best of health.

Dr. N. J. Kulzer, a former graduate of the University of Minnesota Medical School, has joined Dr. P. H. Cremer, Hastings, Minn., in the general practice of medicine.

Dr. A. E. Bostrom, who has been in practice for several years at DeSmet, S. D., has moved to Portland, Ore., where he has accepted a position with the State Board of Health.

Dr. Albert J. Wentworth, radiologist of Mankato, Minn., has returned from Cleveland, where he attended meetings of the Roentgen Ray Society and the American Board of Radiology.

Dr. Wm. P. Sadler has been named president of the hospital staff of the Northwestern Hospital, Minneapolis, with Dr. Wm. A. Hanson, vice-president, and Dr. Donald H. Daniel, secretary.

Fifteen Minneapolis and eleven St. Paul hospitals have been placed on the approved list by the American College of Surgeons, at its annual meeting recently held at Philadelphia.

The Blue Earth County Medical Society held its September meeting at Mankato, Minn., with Drs. C. H. Watkins, Rochester; E. A. Meyerding, St. Paul, and S. A. Slayter, Worthington, on the program.

Dr. A. S. Eggers, a prominent physician of Grand Forks, N. D., for over over 40 years, passed away last month at the age of 73 years. Dr. Eggers retired from active practice two years ago.

Dr. David S. Fleischauer, who has been in active practice at Wabasha, Minn., for the last 30 years, passed away on October 14 after an illness of only four days, following an attack of pneumonia.

The Minnesota Academy of Medicine held their October meeting at the Town and Country Club, St. Paul, dinner being served at seven with an interesting program following. Dr. T. S. Roberts presided.

Dr. Henry E. Michelson, Minneapolis, will deliver an address before the members of the Milwaukee Dermatological Society at their November meeting, his subject being "Tuberculosis of the Skin."

Dr. Franklin R. Wright, Minneapolis, was the guest speaker at the October meeting of the Southwestern Minnesota Medical Society held at Fulda. A large attendance was present and a very enjoyable evening was passed.

At the October meeting of the members of the Rice County Medical Society held at Faribault, Minn., Dr. A. W. Adson of the Mayo Clinic was the guest speaker, his topic being "The Diagnosis and Surgical Treatment of Spinal Cord Tumors."

Dr. Arch F. O'Donoghue, Sioux City, Iowa, was the guest speaker at the October meeting of the members of the Medical Society of Sioux Falls, S. D. The doctor presented a paper on "The Surgical Management of Arthritis."

Dr. P. M. Fischer, for more than a quarter of a century a prominent physician of Shakopee, Minn., died very suddenly, the result of a heart attack. Dr. Fischer was always active in civic affairs, and an enthusiastic sportsman for wild game.

The members of the Cascade County Medical Society held their October meeting at Great Falls, Mont., when plans were started for the arrangements for the state meeting of the medical association which will be held in that city during July, 1937.

A large attendance of the members of the Mount Powell Medical Society was held at Anaconda, Mont., on October 19, when Dr. Joseph Lynch, Spokane, Wash., presented an illustrated scientific address on "Treatment of Brain Abscess."

Dr. C. F. Ewing, Wheaton, Minn., was the winner of the champion cup in the golf match played by the members of the Great Northern Railway physicians at their annual meeting held at Seattle last month. There were 152 doctors entered in the contest.

Dr. J. H. Simons was installed as president of the Hennepin County Medical Society on the evening of October 5. The society has increased its membership over 50 during the past year, the total now being 641 members, the largest in the history of the society.

The meeting of the Upper Mississippi Medical Society was held at Bemidji, Minn., on October 31. Papers were presented by Drs. Martin Nordland, Minneapolis; L. Richdorf, Minneapolis; C. F. Reichelderfer, Staples; E. C. Hubin, Deerwood, and C. W. Mayo, Rochester.

Minneapolis has been selected for the 1937 convention of the American Urological Association. The gathering will bring about 1,000 delegates here from June 29 to July 1, with the Twin City Urological Association and the Hennepin County Medical Society acting as hosts.

Dr. and Mrs. Horace Newhart of Minneapolis have recently returned from a short vacation in Europe, spent chiefly in Germany, Austria and Switzerland. While in Berlin the doctor attended the Third International Oto-rhino-laryngological Congress as a delegate for the American Otological Society and the American Laryngological Association.

The fall meeting of the Yankton, S. D., District Medical Society was held at the State Hospital, with Dr. G. S. Adams and staff as hosts to a party of over 60 being present at the fine dinner served. Dr. W. H. Schmitz, Omaha, was the guest speaker, presenting a paper that was thoroughly enjoyed and discussed by the members. Several new members were admitted as members of the society.

The Committee on Maternal Welfare of the Sixth District Medical Society sponsored a refresher course in obstetrics on September 21 and 22 at Bismarck, N. D. Dr. John Urner of the Minneapolis General Hospital conducted the course, and Drs. Brandt, Freise, Henderson and Owens assisted with case reports and demonstrations. The meetings were well attended by practicing physicians from all over the district.

On September 24, 1936, there was held a regular quarterly meeting of the Eastern Montana Medical Society. Members of the Fergus and Northeastern Medical Societies were guests. The meeting was held at Jordan. The guest speaker was Dr. Austin C. Davis of Rochester, Minn., who spoke on the significance of "Basal Metabolic Rates, Both High and Low." His very excellent paper was very much enjoyed by the three societies. There were 22 members present and they traveled a total of 5,680 man-miles by automobile to attend this meeting.

At the annual meeting of the Great Northern Railway Surgeons' Association, held in Seattle, Wash., on September 25 and 26, Dr. E. H. Frost, Willmar, Minn., was elected president; Dr. R. E. Weible, Fargo, N. D., first vice-president; Dr. W. F. Sihler, Devils Lake, N. D., second vice-president; Dr. H. W. Goehrs, St. Cloud, Minn., third vice-president. The 1937 meeting will be held on the eastern portion of the road, and the time and place will be decided upon by the executive committee. The meeting was attended by over 100 members of the association.

Dr. H. M. Workman, Tracy, Minn., aged 81 years, widely known in state medical circles, died at a hospital Thursday, October 8, after an illness of several days from a heart ailment. A graduate of the University of Chicago, Dr. Workman several times was president of the Minnesota State Medical Association and at the time of his death was a member of the medical council of the organization. Coming to Tracy in 1882, Dr. Workman took an active part in community affairs. He was president of the school board more than 20 years. He is survived by a son, Dr. W. G. Workman, of Tracy.

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Some Complications Attending Artificial Pneumothorax*

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COMPLICATIONS may occur with such simple procedures as irrigation of empyema cavities and the changing of drainage tubes, as well as with surgical operations and introduction of a needle into a pleural cavity. In fact as early as 1864, Roger[1] called attention to them. Since that time, chest surgery has undergone rapid development and the introduction of the needle into the pleural cavity has become a common procedure both in diagnostic and therapeutic work. With the increased work on the lungs and pleura came an increase in the complications; so much so that numerous reports of such conditions are now in the literature and splendid clinical and experimental studies have been made to learn their cause and frequency, as well as the best methods of treating and preventing them. Space does not permit the discussion of such complications as air embolus, accidental or spontaneous pneumothorax or empyema. However, they have been presented in other articles.[2]

Operators have occasionally experienced the **breaking of a needle** in the chest wall. This accident in itself may not be serious but the removal of the needle is not always a simple procedure as it may fall into the pleural cavity. The use of rustless steel or gold needles materially decreases the chances of such accidents.

When a needle is introduced for exploratory puncture or the removal of fluid, atmospheric air may be aspirated in sufficient amount to cause pneumothorax. We have seen numerous cases whose pneuomothoraces were brought about in this way. The lumen of the needle should be sufficiently guarded to prevent entrance of air into the pleural cavity. This precaution is particularly important when one lung is already under artificial pneumothorax treatment and an attempt is made to aspirate fluid from the contralateral cavity.

EMPHYSEMA

Superficial or subcutaneous emphysema occurs when the tip of the needle is only in the chest wall when air is introduced or when air which has reached the pleural cavity leaks through the needle tract into the subcutaneous tissues. It may develop immediately after puncture of the pleura or be delayed for some time. It is especially apt to occur when a large needle is used or a high intrapleural pressure is produced or following a severe attack of coughing. The crepitation which one elicits through palpation of the skin in the vicinity of the needle puncture usually disappears within a few days in the mild case, to a week or so in the more severe one. It results in no harm but may cause the patient considerable alarm if its possible occurrence has not been previously mentioned.

Mediastinal or deep emphysema tends to be much more distressing to the patient, interfering

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with his breathing to some extent, but it is not serious. In cases in which it is associated with accidental pneumothorax, the prognosis depends entirely on the accidental pneumothorax and not on the emphysema. Treatment is not necessary.

Hemorrhage

Thoracentesis may result in internal or external bleeding. External hemorrhage is insignificant as a rule; it is brought about by direct injury of a mural vessel, and the oozing is readily brought under control by the usual means of hemostasis. We have seen small subcutaneous hematomas occur a number of times but they usually disappear in a few days with no harmful results. Puncture of the intercostal vessels occasionally takes place, in which case the bleeding is more serious; it is also apt to be internal. This accident may be avoided to great extent by keeping the needle as far from the subcostal groove as possible. Intrapleural hemorrhage may also result from direct injury to the lung, or from puncture of an adhesion containing lung tissue or fairly large vessels. The amount of bleeding in such cases is usually not alarming except where sclerotic tissue prevents the injured vessel's contracting, and as a rule no treatment is necessary. Hemoptysis is occasionally caused by lung injury during thoracentesis or administration of pneumothorax, but it is rarely of any importance. On the whole, hemorrhage as an accident due to the pneumothorax is not a grave concern.

Puncture of An Organ or Cavity Other Than The Pleural Cavity

Penetration of the lung or of an adhesion containing lung tissue is the most frequent and significant of these accidents. This has been discussed elsewhere.[2]

The other accidents in this group are more or less curiosities, with little ultimate effect on the patient. Injury of the diaphragm or of organs in contact with it may occur if a low or anterior interspace is chosen as the site of injection, as is sometimes necessary in cases with adhesions.

Pneumopericardium or hemopneumopericardium may result from such an accident. Pearson[3] describes a case in which he accidentally entered the pericardium; the manometer showed well marked negative oscillations synchronous with the heart beat. The needle was withdrawn and the patient suffered no ill effects. Tappainer[4] describes a case of pneumopericardium resulting from pneumothorax. We have seen two such cases, one of which was later reported in detail by Rigler[5]. Cases of cardiac puncture have been reported by Minor[6], Stivelman[7] and Burrell[8], but none of them suffered any ill effects.

Elrick[9] found eleven cases of pneumoperitoneum in the literature, and adds one of his own.

Actual puncture of the diaphragm with direct introduction of air into the abdominal cavity is the most usual cause of this accident. Although it is generally stated that reversed respiratory fluctuations are observed if the needle is in the abdomen, this is not always true. One cannot, therefore, be sure of the location of the needle by the manometer reading, which explains why this is the most frequent cause of pneumoperitoneum.

The presence of a congenital defect resulting in communication of the pleural cavity and peritoneal space occasionally is the cause for pneumoperitoneum when air is introduced into the pleural cavity. This is not a serious complication since the air is absorbed in a short time. Pneumoperitoneum has been recommended as a therapeutic procedure in some cases of bilateral pulmonary tuberculosis since it elevates and partially immobilizes the diaphragm.

Hemoperitoneum from injury to an intra- abdominal vessel or organ may occur but is not diagnosed unless it becomes extreme. Injury to abdominal viscera may occur, such as the case of pneumokidney following pneumothorax reported by Parajon. We have seen one case which was demonstrated to us by another physician.

Diagnosis of all these accidents may be very simple or very difficult. If the patient complains of pain or discomfort that may be interpreted as due to diaphragmatic, pericardial, or cardiac injury, especially if the site of injection allows the possibility of such injury, one must ascertain the exact location of the needle. The manometer may or may not give us a clue. One must guard against abnormal fluctuations or those within close limits of the zero point. Finally the x-ray film or fluoroscopic examination may be of aid to substantiate or make the diagnosis. Treatment is usually unnecessary; as a rule the patient suffers merely a transient discomfort. The remote danger of infection must be kept in mind. Prevention consists of avoiding the lower and anterior interspaces in so far as possible (especially when the diaphragm is elevated or the heart displaced); and of strictly obeying the rule that no air is to be introduced unless the manometer readings are satisfactory. The pneumothorax needle must always be introduced with care.

Reactions Following Refills

Most everyone who has given a large number of artificial pneumothorax treatments has seen reactions other than embolus or shock following refills. Gilbert[10] divides them into (1) general nervous reactions, (2) congestive reactions of the opposite side, (3) pleural reactions resulting from an exacerbation of a chronic pleurisy, and (4) refill reaction. In refill reactions, he points out that a few hours after the treatment, the patient usually experiences general malaise and that the temperature rather suddenly rises one or more degrees. In the next few hours, the symptoms usually disappear; he has seen this in two per cent of cases. In all the cases he observed, a sero-fibrinous effusion was present at the time of the reaction. He believes it is a haemoclastic crisis and is due to spontaneous absorption of inflammatory exudate. The intensity of the reaction, he finds, is in proportion to the degree of positive intrapleural pressure. Baron et al[11] are of the opinion that when such reactions occur, pneumothorax treatment should not be abandoned but should be very carefully administered.

Digestive disturbances during the course of artificial pneumothorax have been reported by a number of authors. Epstein[12] cites two cases who had persistent vomiting. He states that they were neuropathic women, and in one the treatment was discontinued permanently. In the other, the treatment was discontinued only temporarily. Bonafe and Mollard[13] found that vomiting rather frequently occurs. They believe that in a few cases with digestive disturbances the reaction is caused by pressure of the diaphragm on the digestive organs. In the majority of cases, however, they are of the opinion that it is due to reflex associated with aerophagy. In some cases, they found symptoms of tuberculous enteritis making appearance following the institution of artificial pneumothorax. In such cases, the intestinal lesions were already present and were not the direct result of treatment. Hepatic disturbances they believe to be caused entirely from the mechanical action of the lower position of the diaphragm. In some cases, with no localized reaction, the patient has a decrease in appetite and loss in weight which they believe is due to the interruption of the normal function of the lungs in lipodieresis and neutralization of toxins. All of these digestive troubles disappear within a few weeks unless they are due to tuberculous enteritis and, therefore, do not contraindicate the use of artificial pneumothorax.

Hoffschulte[14], however, reports the case of a woman whose treatments had to be discontinued because of vomiting which became more severe following each of the first six treatments. Braun[15] had seven cases who presented gastro-intestinal disturbances during the course of their artificial pneumothorax. He noticed more disturbances when the pneumothorax was on the right side. He believes that pressure on the abdominal organs, the esophagus, the mediastinal nerves, and the abdominal plexus together with immobilization of the diaphragm explain the symptoms. In most of his cases, however, he found that the artificial pneumothorax had only increased or reactivated old symptoms.

Shore[16] reported a case of tuberculosis of the right lung treated by artificial pneumothorax who at the end of twelve days had good collapse of the lung. Ten days after treatment was instituted, however, she complained of abdominal pain and vomited. She soon died of acute dilation of the stomach. In reviewing a group of sixty cases with acute dilation of the stomach, he found that ten of them had intrathoracic disease and that it is second only to surgical operations as the cause of this condition.

Mazzetti[17] has discussed hypotonocity of the diaphragm in artificial pneumothorax which he believes is due to large quantities of air or to large effusions. It results in temporary mechanical paralysis which disappears with the decrease in the amount of air or removal of part of the fluid. The resulting flattening of the diaphragm may have an unfavorable effect upon the abdominal organs. He calls attention to the fact that the paralysis is not comparable to that which results from removal of the phrenic nerve, since with hypotonocity cases, there is an increase in distensibility with loss of contractility, while following phrenic nerve operations, both are destroyed. Labbe and Boulin[18] have discussed eventration of the diaphragm in pneumothorax.

During the course of artificial pneumothorax treatment, neuritis occasionally develops. A number of workers have seen patients who experienced a great deal of pain in the region of the distribubution of the trigeminus nerve. Schmid[19] has reported a case of neuritis of the cervical and brachial plexus which became much worse following refills. Although he offers no explanation for this condition, he found that the symptoms disappeared when the patient's general condition improved.

We have seen a number of slight reactions following artificial pneumothorax refills such as temperature elevation but have seen none that would necessitate discontinuing treatment.

Pleural Adhesions

In artificial pneumothorax work, adhesions are often a very serious complication in that they prevent satisfactory collapse of the diseased part of the lung. Unfortunately, before an attempt is made to institute artificial pneumothorax, one cannot always be certain from x-ray film and other methods of examination as to the existence and extent of adhesions. Therefore, even though they appear to be present when artificial pneumothorax is indicated, it should always be attempted. On the other hand, however, when they appear to be absent and artificial pneumothorax is attempted, one rather frequently finds obliteration of the pleural space. Unfortunately, adhesions are frequently present in moderately and far advanced pulmonary tuberculosis before treatment is instituted. Grenier[20] called attention to their almost universal presence in such cases and showed that their site of predilection is the apex of the lung. This probably is due to the more common occurrence of tuberculosis in this region and to the limited movement of the apex. The development of adhesions over the apex may be accompanied by little or no pain, therefore, the patient gives no history of having had pleurisy. In a recent study[21], we reported that in from 35 to 52 per cent of the patients with moderately or far advanced disease for whom artificial pneumothorax was indicated, we were unable to produce complete collapse because of adhesions.

deKovats[22] states that apical adhesions must carry the weight of the entire lung when interlobar fissures are obliterated and, therefore, they are unduly stretched if too high pressures are used. He points out further that at the level of the interlobar fissures, particularly on the right side, is a site of predilection for adhesions since interlobar pleurisies tend to involve the parietal and visceral pleura. This is particularly unfortunate when one desires to collapse the lung, especially when the mediastinum is flexible.

When adhesions do not completely obliterate the pleural space, they may stretch as the lung collapses and retain their attachment to both the visceral and the parietal pleura. Such adhesions constitute a definite hazard in that they may tear loose at any time producing fistulae and even allowing air to enter blood vessels resulting in embolism. This subject has been discussed in more detail elsewhere.

Ilse Franz[23] made a histological study of such adhesions after which he classified them as follows: (1) those composed of pure connective tissue, (2) those consisting of connective tissue and lung tissue, (3) those of hour-glass form. In all, he examined thirty-seven adhesions and found that eleven were pure connective tissue, twenty belonged to the hour-glass type and in six there was lung tissue permeating the adhesions. In two-thirds of his cases, lung parenchyma was concerned in the formation of the adhesions.

Wiercinski[24] recommends the use of localized diathermy treatment for pleural adhesions believing that it results in the atrophy and the stretching of them, and thus aids somewhat in collapsing cavities which the adhesions previously held open. He believes that it may even eventually result in severing adhesions. However, the method found best in treating the case which has band-like adhesions preventing a satisfactory collapse of the lung was first reported by Jacobaeus[25, 26] who examined the chest with a thoracoscope and introduced galvanocautery in 1910. It consists of cauterization with galvanocautery. In 1921, he reported the results of this operation in forty cases. In this entire group, there had been no serious hemorrhage; however, in 50 per cent, pleural exudate formed but absorbed within a short time with an exception of 8 per cent in whom tuberculous empyema developed, with three deaths. In 75 per cent of the forty cases, he was able to destroy the adhesions to such an extent that the lung subsequently collapsed well under continued artificial pneumothorax. In 1922 Jacobaeus stated that the clinical results were not entirely satisfactory, inasmuch as only two-thirds of his cases were free from symptoms of tuberculosis following the operation. While he was unable to obtain good results in as many such cases as one obtains by the use of artificial pneumothorax uncomplicated by adhesions, he still is of the opinion that cauterization of string-like or membrane-like adhesions has a very definite place in artificial pneumothorax therapy. Since Jacobaeus introduced the method and reported results of his cases, a number of workers in various parts of the world have found the method quite satisfactory. Such physicians as Unverricht[27] and Dahlstedt[28] have shown that fever decreases, sputum and cough disappear or are diminished, that the sputum is frequently negative following this operation. They also report formation of fluid with the occasional case of empyema and hemorrhage directly following the operation.

Maurer[29] finds that adhesions which have neither the pulmonary nor the thoracic insertion broadened-out are not dangerous to divide; but since they are very elastic and stretch almost without limit, the effect of dividing them is somewhat illusory. When the adhesions present a broadening-out at the thoracic attachment, they are not so elastic and, therefore, better results are obtained by dividing them. Adhesions which present a conical shape at the pulmonary attachment usually contain lung tissue. From this group he obtains the best therapeutic results but unfortunately they frequently contain lung tissue which, if severed, is likely to result in empyema. The fourth group of adhesions present a broadening at both the pulmonary and the thoracic insertion; the narrower midportion is usually fibrotic and does not contain lung tissue. In such cases, the danger of infection is not great and the result is usually good.

After Maurer[29] locates the adhesion he uses 0.4 per cent novocaine to anaesthetize the adhesions and the parietal pleura. In all adhesions, except those in which neither the thoracic nor the pulmonary insertions are broadened out, he proposes that they be enucleated from the chest wall because of the danger of hemorrhage in this region. He has devised an instrument which consists of a platinum loop mounted on a special body which furnishes either an electric current in the form of a red hot flame or a high frequency coagulation current. Thus the two phenomena of coagulation and suction are included in one instrument. He points out certain contraindications such as early syphilis and nephropathies. Laryngeal tuberculosis is favorably influenced by pneumothorax, therefore, cauterization of adhesions is indicated. Mild pneumothorax exudates or empyema are not always contraindications. He calls attention to the fact that it is difficult to determine the number, form and size of adhesions from x-ray films although he finds stereoscopic films very valuable. From one hundred and sixty operations, there was no operative mortality and only two of his cases were later complicated with empyema.

Douady and Meyer[30] employ Maurer's method and are of the opinion that his procedure brings about disinsertion of the adhesion in a zone which is absolutely free from pulmonary tissue and the adhesion is cut by a process which prevents hemorrhage. They are of the opinion, however, that great caution should be exercised when numerous tubercles are seen on the thoracic wall, on the lung or on the adhesions and when fluid already present has become cloudy.

Matson[31] reported one hundred cases treated by cauterization of adhesions in artificial pneumothorax. Fourteen had single string or band adhesions, forty-four had multiple string and band adhesions, forty-two had diffuse folds. In ninety-two cases, a single operation was performed with sixty-eight being successful; the remaining twenty-four unsuccessful cases had diffuse fold type of adhesions. Two operations were performed in each of four cases; three were unsuccessful because of the presence of diffuse folds. Three operations were performed in two cases with success. Two patients required four operations; each one failed because of adhesions of the diffuse fold type. In forty-two of Matson's cases, a small amount of fluid was present. He found that in patients with fluid the reaction to operation was no different than those without fluid except that more fluid occurred after the operation in those who previously had fluid. Among fifty-eight patients who had no fluid before operation, forty-eight developed it; in twenty-eight of these, however, no special treatment was necessary. Sixteen patients developed tuberculous empyema. In three of these cases, it was necessary to resort to tube drainage; nine were treated successfully by oleothorax and four were still under treatment progressing satisfactorily at the time the report was made. When Matson sees pleural tubercles, he anticipates empyema and routinely introduces 150 to 250 cc of 2.5 to 5 per cent cajuput oil preparation in the pneumothorax cavity. In none of these cases did pyogenic bacterial infection occur. Moderate hemorrhage occurred in one case, but it was easily controlled by cauterization. In no case was there severe shock or other serious complications. In five, there was febrile reaction which usually disappeared in less than ten days.

A number of authors such as Dahlstedt[28] and Unverricht[32, 33] have reported hemorrhage following the cauterization of adhesions. Unverricht refuses to sever adhesions which have a bluish-red color indicating the presence of blood vessels. He states that elongated adhesions generally contain no large blood vessels but may connect with pulmonary cavities and contain pulmonary tissue. He cauterizes such adhesions only in the connective tissue areas. In 452 operations, 125 developed exudates, five of which were due to mixed infections and nine to tubercle bacilli. If fluid pre-existed he did not hesitate to cauterize adhesions if the patient was not febrile and there was a preponderance of lymphocytes in the fluid. He points out that in some cases after adhesions are cauterized further surgery is necessary. His results compare favorably with those of complete pneumothorax cases, since among 247 with complete cauterization, 61 per cent were practically healed and 27 had died in from two to nine years after the pneumothorax was discontinued.

Heymer[34] performed two hundred cauterizations and obtained good collapse in 51.9 per cent; partial collapse in 37.7 and negative results in 10.4 per cent. Clinically 9.4 per cent of the patients showed marked improvement, 74 per cent improvement, and 16.1 per cent were not benefited. The operation decreased the number of cases with tubercle bacilli in the sputum from 91 per cent to 32 per cent. A small amount of fluid formed in 88 per cent of his cases but absorbed within ten or twelve days. Among the 200 cauterizations, there was not one with serious hemorrhage following the operation. Seven per cent of them developed moderate or large amounts of fluid, and two patients had empyema.

Gullbring[35] reports sixty cauterizations and points out that this operation has definitely extended the utility of artificial pneumothorax treatment. In his series, two small hemorrhages occurred which were easily controlled. A third hemorrhage from the sub-clavian artery proved fatal. Of thirty-eight cases, the sputum was rendered negative in thirty-three.

Kremer[36] uses a thoracoscope with ventilation which removes the smoke from the field of operation. Numerous authors such as Piquet[37], feel the cauterization of adhesions is usually without danger and should be more widely practiced. Sachs[38] reports four cases in which pleural adhesions were divided; two with the open and two with the closed method. Better results were obtained in the closed method, therefore, he recommends it.

Adhesions may develop during the course of artificial pneumothorax treatment as the result of pleural effusion, although an appreciable number follow empyema, a dry adhesive pleuritis, or irregular fillings that allow the pleural layers to come in contact at such times. Their formation is to be suspected whenever the rate of air absorption diminishes. Manometer readings which fail to drop during the interval or which are higher at the beginning of a refill than at the end of the last one are typical. Prevention of adhesions is very necessary lest they result in premature loss of the collapse and its advantages. Therefore, as soon as adhesions are suspected, active steps must be taken. Refills should be given more frequently, and a slightly higher pressure used. Unfortunately, in spite of such precautions, many of these cases will continue to complete obliteration of the pleural space with loss of collapse. When it becomes obvious that the adhesions are continuing to form, olive oil or mineral oil should be introduced in quantities sufficient to replace most of the air. When artificial pneumothorax is lost through obliterative adhesions, the outlook is not as gloomy as might be thought at first glance. Many of these cases have good results from even a short period of treatment. This probably is due either to the fact that fibrosis is set up in the lung or to the incomplete re-expansion of the lung as it becomes bound down by the thickened pleura. However, an appreciable number of patients reactivate their disease after artificial pneumothorax is lost, especially if cavities were present before the treatment was begun.

Mediastinal Displacement and Hernia

The normal mediastinum is labile and because of its elasticity responds readily to difference in intrapleural pressure. The negative pressure in the pleural cavity determines the position of the mediastinum. That is, if gas is introduced into the pleural cavity on one side so as to reduce the negative pressure, the mediastinum is displaced toward the opposite side because of the difference of the pressure, thus reestablishing the equilibrium. Only when the difference in pressure in the two sides is slight, or the mediastinum has become inelastic and firm because of earlier pathology or adhesions, do the two pleural cavities tend to become independent of each other. Usually in beginning artificial pneumothorax treatment, there is some mediastinal displacement in an appreciable number, especially if complete collapse is induced rapidly. This is one reason for inducing pneumothorax slowly except in extreme emergencies, such as severe hemorrhage.

The displacement may take the form of respiratory fluctuations or of actual herniation. Respiratory fluctuations are best seen under fluoroscopic examination. This is because the mediastinum shifts toward the pneumothorax side during inspiration (when the intrapleural pressure is more negative), and toward the functioning side when the pressure is less negative. Since x-ray films are ordinarily taken during the inspiration, they usually do not show mediastinal displacement to its full extent. The displacement may be limited to the anterior-superior mediastinum or involve the entire partition. In the latter case the whole mediastinum may be pushed over so far as to invade one-fourth to three-fourths of the functioning lung space during expiration. The degree of displacement depends upon the mobility of the mediastinum and its contents and upon the degree of pressure in the pleural cavity. In the absence of pleural pericardial adhesions, the heart and the entire mediastinum may be displaced into the opposite side of the chest, as is occasionally seen in spontaneous pneumothorax or pleural fluid and high positive pressure. Mediastinal displacement may allow the introduction of large quantities of air without change in the manometer readings. Therefore if much air is being introduced, one should make frequent x-ray examinations. A marked mediastinal shift may decrease the vital capacity out of proportion with the air introduced. Whether part or all of the structures are displaced, the symptoms associated with mediastinal displacement are slight and as a rule no treatment is necessary. This is probably because respiratory fluctuations of the mediastinum encroach on the functioning lung during expiration and so do not seriously interfere with the oxygenation of the lung. The chief disadvantage of mediastinal displacement lies in the ultimate result. A mediastinum kept displaced over long periods of time gradually loses its elasticity and becomes fixed in an abnormal position. This is undesirable; therefore, one should try to keep the intrapleural pressure low enough to prevent it. If the lung cannot be kept under a satisfactory state of collapse with such low pressure, a few cubic centimeters of sterile olive oil or mineral oil introduced into the pleural cavity will often suffice to fix the mediastinum so that higher pressure may be used without displacement. Hislop[39] believes that displacement of the mediastinum occasionally gives rise to dry pleurisy on the contralateral side. He believes this is due to the pressure which lessens the amount of serous fluid between the visceral and the parietal pleura. The resulting pleurisy is not, therefore, tuberculous, and is no reason for discontinuing artificial pneumothorax treatment. He believes that low pressure in the pneumothorax cavity is indicated in such cases.

A slight shift of the mediastinum may have a good effect upon lesions in the contralateral lung. This possibility accounts in part for the remarkable improvement which one observes in the contralateral lung after collapsing the lung with the more extensive disease. We have observed this a good many times and, therefore, no longer look upon certain areas of disease in the better lung as a contraindication to artificial pneumothorax.

Actual herniation sometimes occurs, the sac being formed by the mediastinal pleura, and the contents being a portion of the collapsed lung. This tends to occur through the weak portions of the mediastinum—the anterior-superior portion, and the posterior inferior portion. Herniation is much more common through the former; it is very unusual through the latter.

Hager and Langebeckmann[40] observed thirty-one cases of hernia, thirty of which occurred in the upper anterior space. These hernias occurred sixteen times in left, eleven times in right, and three times in bilateral pneumothorax. The diagnosis was easily made by fluoroscopic examination. Bernard *et al*[41] reported three cases of mediastinal hernia due to the introduction of excessive amounts of gas. In each case, the hernia was in the left pleura. They found that it disappeared with less pressure and longer intervals between treatment and had no unfavorable effect on the course of the artificial pneumothorax. Hale[42] described a case of mediastinal hernia and reviewed five others from the literature. Kellner[43] calls attention to the case of a large accessory pneumothorax in front of the heart and large vessels produced by moderately high pressure which resulted in sudden death of the patient. He ascribes it to the so-called "weak point in the mediastinum."

Sergent[44] reported eleven cases in which artificial pneumothorax caused distention with gas of the retrosternal pleural sinus on the contralateral side. He believes this is due to the presence of relaxed cellular tissue replacing the thymus. He finds that this condition in no way interferes with the treatment but is an indication for lower pressure and longer intervals between treatment.

This complication does not depend on the presence of a labile mediastinum; in fact, Pollock[45] and Dumarest and Brette[46] believe that herniation occurs with a relatively inelastic pleura subjected to overstrong positive pressure. The hernia does not move with respiration, and tends to be associated with discomfort and interference with the function of the good lung. Reduction of pressure will usually relieve it.

Mediastinal rupture has been reported, but it is very unusual. Wilson and Jones[47] have reported a case, and Riviere[48] mentions a case reported by Walsh. More serious complications of mediastinal hernia because of their greater incidence, are: occurrence of discomfort and dyspnea, interference with circulation (Stivelman *et al*[49]) and the occasional occurrence of lung edema (Riviere[48]).

Disease in Contralateral Lung

Pulmonary tuberculosis is a disease which has a marked tendency to become bilateral when no treatment is instituted. Even when the diseased lung is collapsed there is still the possibility of disease later appearing in the contralateral lung. Collapse should never be instituted too rapidly because of the possibility of expressing into the bronchus a large amount of bacilli-containing sputum which may be aspirated into the opposite lung. Theoretically at least, after the lung is collapsed, hematogenous and lymphatic dissemination is reduced to a minimum. Exogenous reinfection is always a possibility if the patient is allowed to associate with persons who have communicable tuberculosis. One must not overlook the fact that the lesions in the contralateral lung may be present but undemonstrated at the time artificial pneumothorax is instituted, that is, they may be so small or so located that their shadows are not visualized on the x-ray film. The fact remains that many patients on artificial pneumothorax develop previously undetected lesions in the opposite lung or spread of lesions already present.

To aid in the prevention of bronchogenic spread we always advise patients to lie as much as possible on the pneumothorax side until the disease has been brought well under control. To avoid the dangers of exogenous reinfection, we strongly recommend that contact with other tuberculous patients with positive sputum be broken at the earliest possible moment.

When disease in the contralateral lung develops or reactivates, one of three courses may be taken. When minimal disease appears in the contralateral lung, it may be safe to treat it conservatively for a while by simple observation. Some such lesions will improve without interference and without discontinuing the original collapse. However, when the disease is definitely progressive, one may give up the original collapse and induce pneumothorax of the other side, especially if one is reasonably sure that the lesion in the original lung is well under control. Unfortunately, many cases of contralateral spread of disease occur early. For example, Rist[50] found 50 per cent occurring within the first six months of treatment and before enough time had elapsed to bring the initial lesion well under cotrol.

In patients who have new disease appear and remain progressive or old disease reactivate in the contralateral lung before the original disease is well controlled bilateral partial collapse may be of great value. This procedure is logical and is being used by many physicians with good results.

The development of disease or the reactivation of disease in the contralateral lung is among the most serious complications of artificial pneumothorax. Rist believes that 75 per cent of the deaths among pneumothorax patients are due to this complication. Yet, we must agree with Riviere that this complication occurs in spite of and not because of pneumothorax therapy.

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Obstetrical Analgesia

With Particular Consideration of the Use of Cyclopropane in a Specially Constructed Apparatus for Controllable Analgesia

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CYCLOPROPANE, $CH_2CH_2CH_2$, a hydrocarbon gas was shown by Lucas and Henderson,[1] in 1929, to be a satisfactory anesthetic. Recently many investigators have reported that this gas is a satisfactory and safe general anesthetic in surgery and obstetrics.[2, 3, 4, 5]

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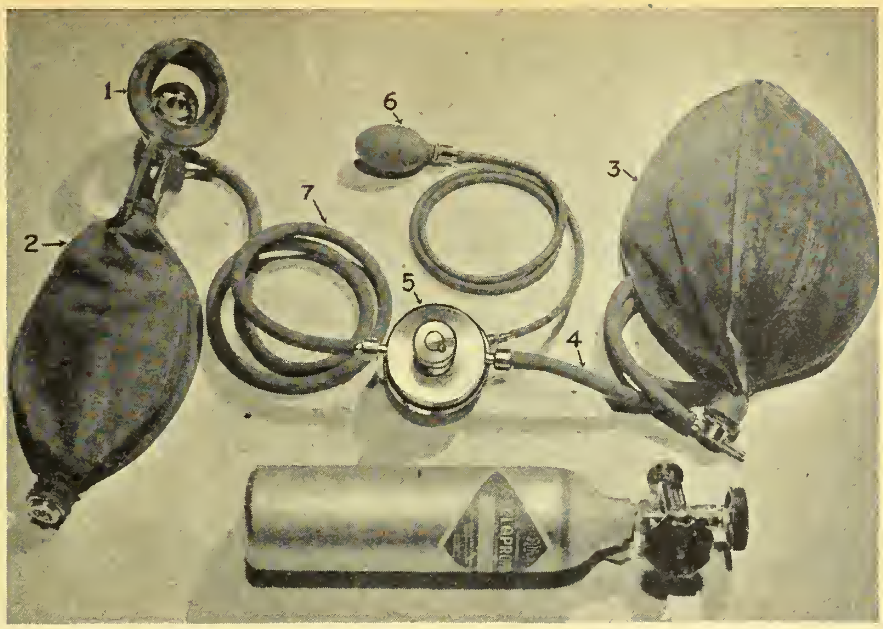

FIGURE I

Since Sir James Y. Simpson demonstrated that anesthetics could be used for analgesia in obstetrics, all have been investigated with more or less satisfaction; none has been found to be ideal and the most favored, nitrous oxide, is far from satisfactory in many respects.

The evaluation of analgesic agents for "painless childbirth" is an important problem in modern obstetrics. To the woman of today, pain relief is often her most important consideration as she contemplates or approaches motherhood. Her demands, stimulated by unsound principles voiced in many lay journals, many times exceed all reason as her tendency is to disregard caution and safety in her effort to avoid the pains of labor.

The profession has made an honest effort and has gone as far as possible in its attempts to relieve the pains of labor; in fact, it is believed it has gone too far and that much harm has been done because of the uncertainty of the methods used and their effects upon the mother, the baby and the mechanism of labor. There is great confusion in the selection of an entirely satisfactory analgesic agent.

We believe that we have developed a method of controllable analgesia in the use of cyclopropane which has no immediate or remote untoward effect upon the mother and baby and at the same time, gives almost or complete relief of pain with no interference with the mechanism of labor of any kind.

In 1935, before the section of Obstetrics and Gynecology and Abdominal Surgery of the American Medical Association, one of us (Knight)[6] reported upon the use of cyclopropane in obstetrics on a small group of thirty-one patients. In these individuals the cyclopropane was given with oxygen from a standard anesthesia machine. It was administered in second stage labor by a trained anesthetist and was continued throughout as an analgesic and anesthetic agent as occasion demanded. The results were pleasing and gave encouragement for further study.

This report is upon another group of entirely normal patients having been given cyclopropane by a new method and technique, administered by the patient and which is controllable in all respects. It covers a need in obstetrics which has always been desired, but has not been adequately or accurately accomplished by any other method in use at the present time.

Because cyclopropane is a powerful and rapidly acting gas which requires only ten to twenty-five per cent of the gas with oxygen or air to produce deep surgical anesthesia, a much smaller amount than this is necessary to secure analgesia. The quantity of the gas, therefore, displaces so little of the air or oxygen that ordinary room air may be used as a vehicle and provides an abundance of oxygen for respiratory needs. This has made it possible to construct a simple apparatus for the administration of the gas with air as an analgesic agent during labor.

Our apparatus (Figure1) consists of the following parts: a close fitting mask (1) is comfortably strapped to the patient's face. Air to be inhaled enters the mask through a ten inch length of accordion tubing, perforated and enclosed in a small rubber bag (2). A one way valve, ((1) Figure 2) on the mask permits the escape of exhaled air. A two gallon supply bag, (3) Figure

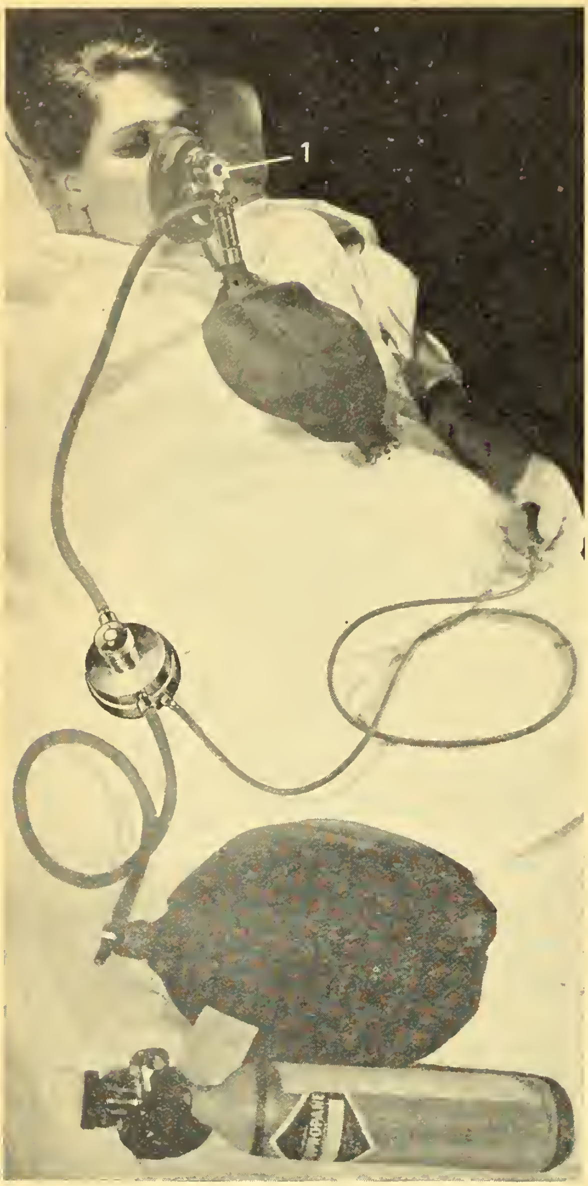

FIGURE II

1, is filled about three-quarters full of cyclopropane; from this bag a length of rubber tubing (4) leads to a variable gas regulator (5) placed between the mask and the gas bag. The gas regulator is actuated by a rubber bulb (6) which is held in the patient's hand. Another length of rubber tubing (7) connects the regulator and the mask and completes the open gas circuit.

When the apparatus is attached to the patient in labor, there is no gas flow; unless the bulb is compressed she breathes only unmodified room air. As a pain begins, she rapidly operates the bulb and takes deep inhalations until she gets relief, at which time, she goes into deep analgesia or early anesthesia. Her hand then refuses to function and all gas flow stops whether the bulb remains open or closed.

The regulating device is quickly and easily adjusted to a capacity of from zero to twenty cubic centimeters of gas for each full compression of the actuating bulb. We have found that in most patients the largest amount is more desirable as she then obtains relief from her pains very quickly; almost as soon as they begin. She recovers very rapidly from her analgesia and waits for her next pain in full consciousness.

The gas may be given as soon as the patient desires relief from pain. We prefer to begin when the pains are strong and regular and the cervix dilated to about four centimeters. It is noticeable how quickly the patient will relax and stop resisting her pains, through the abolition of anxiety and fear; this seems to aid in permitting her uterine contractions to reach their maximum efficiency. There is some evidence that labor progresses more rapidly, but until we have had more experience we cannot be sure of this point.

No agents or methods in medical practice are without characteristics which call for precautions. In the use of cyclopropane and this simple apparatus the following should be kept in mind.

This gas is inflammable and explosive and should not be used under conditions where it is common practice to avoid the use of ether. No flames or sparks should be permitted in the room and static influences are to be avoided if possible. A room with good ventilation is all that is necessary if the above precautions are followed.

In inflating the reservoir bag, it should not be distended more than three-quarters of its full capacity. It should lie free and have nothing making pressure upon it as even slight pressure may be sufficient to cause a continuous gas flow without the operation of the hand bulb. As a matter of further precaution, the bag should never be left attached to a tank.

The competence of the valves and regulator are tested by smelling the end of the tube going to the mask attachment. There should be no gas flow except when the bulb is operated.

When taking the gas, the patient becomes very quiet; she will answer all questions, but has no desire to carry on a conversation; she is conscious of her surroundings, but pays little attention to them. Her pulse, respiration and blood pressure remain within normal limits. It is best to keep her in this condition on the minimum amount of gas by turning down the regulator as much as conditions permit.

As a matter of obstetrical principle, the bladder should be kept empty, the blood pressure checked often and the condition of the fetal heart determined at frequent intervals. There are no contraindications for rests at any time they are deemed necessary, the apparatus being removed during this time.

When second stage labor begins, frequent rectal examinations are of value as the analgesia often masks the severe objective pains and the expulsive efforts of the patient, and one may find her ready to deliver without sufficient time for adequate and complete preparation.

At the present time our procedure is to carry the patient under cyclopropane analgesia as in the foregoing, and when the presenting part reaches the pelvic floor, give nitrous oxide, ethylene or cyclopropane from a standard anesthetic machine in charge of a trained anesthetist. We believe this is the best method as we are then permitted to work with the patient in a stage of deep anesthesia for necessary operative deliveries and extensive repairs with maximum safety.

In using the small machine, it is perfectly possible for another person to administer a quick and complete anesthesia which is satisfactory to the obstetrician. This may be justified in the hands of a trained anesthetist thoroughly familiar with the use of cyclopropane in surgical anesthesia. We must remember, however, that this is an exceedingly potent gas and an overdose may be easily given as the small machine has no source of concentrated oxygen and carbon dioxide; thus it would be very easy for a distressing situation to arise.

A very safe method may be followed by allowing the patient to continue operating the machine during delivery. She is fully conscious and is able to cooperate fully as to making expulsive effort and regulating her gas intake at the obstetrician's direction. Uncomplicated repairs may be made in this manner.

The question of re-breathing used in an effort to conserve gas has been considered. The chemical company which has developed the apparatus with our collaboration, has arranged for us a modification of the mask which permits any degree of re-breathing. It does save gas and makes the administration smooth and more effective; but it brings with it more danger. It artificially stimulates respiration which is very deceptive, it increases the concentration of the gas and it reduces the oxygen content of the inspired air a great deal below its normal amount. We believe, therefore, that re-breathing, if used at all, must be under the guidance of a skilled anesthetist.

We have had excellent clinical results in our entire group of patients, thirty-two of which are tabulated in the appended table. Our conclusions have been derived by clinical and laboratory observation and the individuals' statements following delivery. In practically all patients only the

TABLE I

Case	Age	Parity	Effacement and dil. of cervix	Length of Labor	Hours gas used	Blood loss measured	Gal. of gas	Operative Interference	Condition of mother	Condition of baby	Results of Analgesia
1	27	G. I P. O	4 cm. 50%	4′ 35″	2′ 40″	125 cc.	6.0	none	excellent	excellent	excellent
2	27	G. I P. O	3 cm. 50%	19′ 8″	10′	200 cc.	45.0	none	good	good	excellent
3	20	G. I P. O	6 cm. 75%	6′ 40″	1′	250 cc.	3.0	none	excellent	excellent	excellent
4	25	G. I P. O	6 cm. 80%	7′ 40″	1′ 20″	250 cc.	6.0	none	excellent	excellent	excellent
5	20	G. I P. O	8 cm. 90%	15′	1′ 50″	50 cc.	4.5	none	good	good	excellent
6	23	G. I P. O	8 cm. 75%	7′ 55″	50″	175 cc.	2.5	none	excellent	good	excellent
7	21	G. I P. O	complete	6′ 50″	55″	150 cc.	6.0	none	excellent	excellent	excellent
8	22	G. I P. O	7 cm. 80%	17′ 5″	3′ 10″	250 cc.	9.0	breech	good	good	excellent
9	18	G. I P. O	8 cm. 70%	6′ 45″	2′ 41″	150 cc.	7.5	none	excellent	excellent	excellent
10	19	G. I P. O	6 cm. 80%	13′ 24″	2′ 49″	250 cc.	3.0	none	excellent	excellent	excellent
11	22	G. I P. O	8 cm. 90%	4′ 24″	1′ 40″	100 cc.	2.5	none	excellent	excellent	excellent
12	22	G. I P. O	5 cm. 75%	10′ 5″	3′ 20″	150 cc.	6.0	breech	excellent	excellent	excellent
13	29	G. VI P. V	4 cm. 60%	7′ 20″	2′ 7″	75 cc.	4.8	none	excellent	excellent	excellent
14	24	G. I P. O	4 cm. 75%	7′ 3″	3′ 50″	175 cc.	4.5	none	excellent	excellent	good
15	27	G. II P. I	4 cm. 75%	4′ 40″	1′ 4″	135 cc.	2.2	none	excellent	fair	excellent
16	28	G. I P. O	5 cm. 80%	15′ 5″	5′ 30″	250 cc.	7.5	low forceps	excellent	excellent	excellent
17	28	G. IV P. III	4 cm. 60%	3′ 41″	33″	125 cc.	1.5	none	excellent	excellent	excellent
18	17	G. I P. O	8 cm. 90%	20′ 40″	3′ 36″	125 cc.	3.0	none	excellent	excellent	excellent
19	26	G. II P. I	6 cm. 80%	6′ 11″	1′ 20″	175 cc.	1.5	none	excellent	excellent	excellent
20	28	G. I P. O	7 cm. 80%	10′ 38″	2′ 10″	100 cc.	3.0	none	excellent	excellent	excellent
21	20	G. II P. I	6 cm. 70%	4′ 20″	42″	175 cc.	3.0	none	excellent	excellent	excellent
22	24	G. I P. O	6 cm. 70%	17′ 5″	2′ 15″	200 cc.	3.0	none	excellent	excellent	excellent
23	21	G. III P. II	4 cm. 80%	12′ 55″	1′ 40″	125 cc.	4.5	none	excellent	excellent	excellent
24	26	G. I P. O	7 cm. 90%	3′ 5″	30″	210 cc.	1.5	none	excellent	excellent	excellent
25	17	G. I P. O	8 cm. 90%	25′ 50″	7′ 10″	150 cc.	20.0	low forceps	good	excellent	excellent
26	28	G. I P. O	6 cm. 80%	12′ 30″	5′	150 cc.	7.5	none	excellent	excellent	excellent
27	20	G. I P. O	4 cm. 75%	10′ 5″	4′ 10″	250 cc.	10.5	none	excellent	excellent	excellent
28	28	G. I P. O	4 cm. 75%	13′	2′ 30″	125 cc.	9.0	none	excellent	excellent	excellent
29	27	G. I P. O	4 cm. 80%	17′ 15″	2′ 30″	100 cc.	5.2	none	excellent	fair	excellent
30	24	G. I P. O	4 cm. 90%	15′ 45″	3′ 5″	500 cc.	5.2	version 2 twins	excellent	fair	excellent
31	22	G. I P. O	6 cm. 70%	18′ 8″	1′ 7″	200 cc.	4.0	none	excellent	excellent	excellent
32	19	G. I P. O	4 cm. 50%	22′ 45″	9′ 7″	250 cc.	20.0	breech	excellent	fair	excellent

onset of a pain was felt and in none were the pains severe enough to bother them to any degree.

There were no untoward effects of any kind in the mother, there was no respiratory distress, headache or mental dullness following prolonged administration. Nausea and vomiting did occur in a few instances, but with no more frequency than when no analgesia was used at all.

When labor terminated, our patients did not show the usual fatigue; they all commented upon their ability to rest and completely relax between pains. We believe this is a very important consideration as the conservation of strength and energy for second stage labor will do a great deal to permit spontaneous delivery and avoid operative interference.

The degree of amnesia is variable. Most of our patients are able to remember the gross details of their entire labor and delivery and seem pleased that they knew what was going on around them. There is no logical reason why amnesia should be considered of major importance in obstetrical analgesia if you actually abolish pain. Its importance in the usual methods is the failure to remember actual pain the patient has experienced.

In this group of thirty-two representative patients the appended table will show three operative deliveries, two forceps for delay on the perineum in the interest of the baby and one version on a second twin for the same reason. We do not feel that the analgesia played any part in this as these same considerations commonly arise in our patients when no analgesia is used at all.

It will be noted that there were two babies resuscitated with difficulty. Both of these had relatively short cords due to wrapping around the neck and body. In all other instances our babies breathed spontaneously and showed no immediate or remote conditions that could be ascribed to prolonged use of the gas.

Conclusions and Summary

We have reported herewith thirty-two representative patients of a group having been subjected to cyclopropane analgesia given by an apparatus designed for self administration.

We believe, at present, that it is the most nearly ideal analgesia we have seen or used and that it would meet all of the postulates of the ideal analgesia if it were not explosive or inflammable.

The use of cyclopropane with the apparatus in good working order is entirely safe and efficient as the patient regulates her own gas needs and is unable to overdose herself because of her inability to operate the apparatus at the very beginning of anesthesia.

The small machine is very simple and flexible in its application and can be used to supplant other agents so commonly used, under proper conditions, as analgesia in the hands of the patient is far safer than any form of analgesic or anesthetic administered by an inexperienced person.

We decidedly do not recommend the use of this simple analgesic instrument for any purpose other than analgesia with the mechanism operated by the patient, except under conditions where a competant anesthetist trained in the use of cyclopropane is available.

This form of analgesia, like all other methods, must be used under careful observation and supervision, though it is simple and needs very little attention other than refilling the reservoir bag and adjustment of the mask for the patient's comfort.

The patient and her baby, as well as the character of her labor, are the real considerations and may very suddenly demand the most mature judgment to promote the successful and spontaneous termination of the pregnancy. The entire object of any form of obstetrical analgesia used for the relief of pain and developed for the normal termination of pregnancy may be very quickly destroyed by permitting its administration and supervision to the hands of an untrained individual incapable of using good obstetrical judgment.

* * * * *

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Determining Appropriate Body Weight

In Relation to Body Build

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PRESENT interest in attaining and maintaining proper body weight demands a revalidation of methods by which appropriate body weight is determined. Many people are engaged in the fascinating game of altering diet to gain or lose weight in accordance with the dictum of fashion, and these people are leaning heavily upon the validity of "standards of normal weight." These standard tables are largely constructed on the basis of a single figure which represents the average weight for sex, height, and age as determined by a large number of cases. Such a figure represents an average, but not necessarily the appropriate weight for a particular person. Average weight fails to consider individual variations in weight within a normal range, or variations which may be due to different body structure, and is therefore often inappropriate in determining the desirable nutritional status. It is the purpose of this paper to evaluate newer methods for determining body weight on the basis of body build, to indicate their advantage over older methods in determining the nutritional status of the individual, to describe new standards based upon these methods for the age group from 17 to 24 years, and to suggest that standards of appropriate weight should not be expressed as a single weight but rather as a range in weight dependent upon body build.

Interest in body weight arises not only from the decree of fashion, but also as a reflection of lay interest in nutrition and diet as a way to health. This interest has been enhanced by the advertisement of food fads and of the nutritional value of food stuffs, and also has been stimulated by various lay organizations who are studying the importance of food elements in contributing to adequate nutrition. Emphasis upon the importance of nutrition is not misplaced. The medical profession has long recognized the importance of proper nutrition and considers nutritional status as an essential index of general health and well being.

Many investigators have shown that average weight as determined for sex, height, and age fails to give adequate information concerning individual nutritional status. This is particularly apparent to physicians who are working with the nutrition problems of the period of growth. Many children and young adults who impress the examiner as being properly nourished appear considerably underweight or overweight when judged by the height-weight-age tables. We frequently see children who appear properly nourished but who because of small bony framework and thin soft tissues are found to be far below the standard average weight. Conversely, a study of 200 football candidates at Stanford University disclosed the fact that the group averaged 15 per cent overweight as determined by the medico-actuarial tables.

The shortcomings in the use of the height-weight-age tables to determine nutritional status have been pointed out by a number of observers. C. E. Turner[1] stated that "There are two different reasons for a child's being thinner than average. He may be emaciated . . . He may, however, be perfectly healthy, but be thin because he has inherited a slender skeleton." In discussing school health programs, Turner showed that improvement in health habits helped children to grow, but did not change slender children into sturdy children. To be underweight by the height-weight-age tables does not constitute a diagnosis of malnutrition.

Clark and Sydenstricker[2] found 60 per cent of the children judged to be malnourished by clinical evidence were in the Baldwin-Wood 10 per cent underweight group, while 40 per cent were not classed underweight by the tables. Later Clark, Sydenstricker, and Collins[3] showed that a fairly large per cent of well nourished native white children were more than 10 per cent underweight according to the Baldwin-Wood tables.

In Chadwick's[4] study of 25,000 children it was found that merely being 10 per cent or more underweight for height did not constitute malnutrition, while Dublin and Gebhart[5] showed that a large number of undernourished Italian children were not identified by the height-weight-age tables.

The School Health Studies of the American Child Health Association have illuminated the subject and have pointed the way toward better methods of judging nutrition. Franzen[6] first experimented with the relationship of body diameters and thickness of subcutaneous tissue to weight. Later the Association published the A. C. H. Index[7] of nutritional status and finally the Nutritional Status Indices[8]. The A. C. H. Index offers a method of selecting from a large group those children who need a medical examination because of extremely small amounts of musculature and subcutaneous tissue. Three measurements are required: arm girth, chest depth, and hip width. The Nutritional Status Indices reflect amounts of musculature, subcutaneous tissue, and weight in relation to size of the skeleton, and consequently furnish the physician with adequate evidence of the nutritional status. Seven measurements must be made: arm girth, subcutaneous tissue of the biceps, weight, height, chest breadth, chest depth, and hip width. These measurements are referred to a set of tables in order to obtain three indices which compare a child with other children of similar age and build with respect to musculature, subcutaneous tissue and weight. Unfortunately, neither the Nutritional Status Indices nor the A. C. H. Index methods assign expected *individual normal* weight.

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McCloy[9] recognized the relationship between body build and weight and has devised measures of the best weight which will satisfy wide differences in build. He uses five measurements: sitting height, circumference of chest, width of hips, width of elbow and width of knee as a prediction of best weight, correcting when necessary to compensate for excess fat around the chest.

These and other similar studies indicate that variations in body structure must be considered as important factors in the determination of appropriate weight. The individual with large skeletal structure tends to be broad and to have heavy muscle tissue (to support the heavy frame), while the individual with small skeleton tends to be slender and to have light muscle structure. Following the classification of Stockard,[10] we may divide most people into general groups according to body build: the linear type, with slender body build, is thin, but not necessarily tall, while by contrast the lateral type, with broad body build, is stocky and heavier with a lower basal rate. Since these linear and lateral types of body build are largely determined by inheritance, we should not expect an individual who inherits a small skeletal frame and who represents the linear type to weigh as much at the same age and height as does the individual of the lateral type. This is more apparent when it is considered that a small bony framework requires less soft tissue.

Any consideration of weight as a factor in nutrition therefore should depend not alone upon the average weight for sex, height, and age, but also upon some measurement of the individual's body build. Gray[11] has stated that "Weight is best referred to stature, next best to bicristal diameter, and third to age—hence it may be expected that the multiple correlation of weight with stature and bicristal diameter will be better than with stature and age." Several studies concerned with the measurement of differences in body structure have already been described. The A. C. H. Index offers a comprehensive means of measurement and comparison of structural differences in individuals, but fails to designate appropriate weight, except comparatively. The Width-Length Index described by Lucas and Pryor[12] has been used successfully to indicate body build differences in children. Following a study of various body measurements which might be used in indices of body build, the bi-iliac diameter or width of the pelvic crest was selected as the most important and least variable measurement of body width. This measurement is not variable with posture or with respiration, and since the landmarks are definite, in measuring technique acquired easily.

The bi-iliac diameter is measured from the front with straight arm sliding calipers pressed firmly against the widest flare of the iliac crest. This measurement divided by the standing height times 1000 yields the Width-Length Index which expresses width of the body in relation to standing height or relative width.

Width-Length Indices calculated every six months over a four year period by one of the authors[13] on one hundred adolescent girls and one hundred adolescent boys at the Institute of Child Welfare in Berkeley were found very reliable in predicting body build during this period of most rapid growth. The children included in the adolescent study were a normal grade selection from the Oakland Public Schools and represent a normal expected distribution of body build as measured by the Width-Length Index. Their distribution of body build was discovered by comparing means and standard deviations in Width-Length Index by age for the 100 girls in the Institute with a larger series of 674 girls from the San Francisco Bay region. The 100 boys in the Institute were compared with 671 boys in the San Francisco Bay region.

To check the reliability of the Width-Length Index as a test, correlations were found between sets of index values or scores by age groups. Using the index values and one, two, or three pairs of scores from the record of each girl, the correlations were by age as follows:

Ages 11.0 to 11.5 with 11.6 to 12.0 = ± .93
11.0 to 11.5 with 12.0 to 12.5 = ± .88
12.6 to 13.0 with 13.6 to 14.0 = ± .92
11.0 to 11.5 with 13.0 to 13.5 = ± .89
11.6 to 12.0 with 13.6 to 14.0 = ± .87
11.0 to 11.5 with 13.6 to 14.0 = ± .84

To find the value of the Width-Length Index in predicting body build, percentage deviations from mean index for age were used and odd and even halves (in time) of the test material were correlated. Correlations between sets of index score deviations, one pair of scores being used from each case, were by age as follows:

Ages 11.0 to 11.5 with 11.6 to 12.0 = ± .83
11.0 to 11.5 with 12.0 to 12.5 = ± .87
12.6 to 13.0 with 13.6 to 14.0 = ± .89
11.0 to 11.5 with 13.0 to 13.5 = ± .89
11.6 to 12.0 with 13.6 to 14.0 = ± .88
11.0 to 11.5 with 13.6 to 14.0 = ± .83

Because these correlation coefficients were high it would seem that the Width-Length Index was shown to be a valid measure of body build. A child found to be 8 per cent broader than the average for his age-sex group at age 10 years thus is found to have remained approximately 8 per cent broader than average when he has attained the age of 14. The converse is true also.

Classification into linear and lateral types can be done on the basis of relative width. To demarcate linear and lateral types in an unbroken graded series an arbitrary line must be drawn on the distribution curve of the Width-Length Index. One and one-half standard deviations above and below the mean of the Index for age was chosen for the boundary lines. That the individual of the lateral type with large bony framework has thicker soft tissue padding than one of the linear type has been demonstrated. Measurements made at six month intervals over a period of four years on one hundred girls in the adolescent period showed consistently larger arm girths in the lateral type than in the linear type children. The thickness of subcutaneous tissues measured with calipers over biceps, abdomen, and thigh was consistently greater in the broad built than in the slender built children in this series.

That this Width-Length Index is both consistent and reliable as a means of determining body build, and that it allows a safe prediction of nutritional status in children has been shown by Pryor and Stolz[14] in a study of 4560 children. They constructed width-weight tables for ages 6—16 years, showing appropriate weights for different body builds as measured by the Width-Length Index.

To test the superiority of the new width-weight tables over the Baldwin-Wood tables, the amount of deviation from each weight standard was measured on a series of 531 unselected healthy children in the San Francisco Bay region. One-third of the children who were labeled underweight or overweight by the old tables were found normal for their body build by the new method.

In San Francisco Dr. J. C. Geiger, City Health Director, and Dr. Paul S. Barrett[15] used the width-weight tables in a nutrition survey of 4500 children on relief. They reported that cases of actual malnutrition were almost negligible in number when weight was considered in relation to structural development by means of the new standards.

Reports from different parts of the United States show a similar reduction in the numbers of so-called malnourished or overweight school children when these measurements of body build are included in appropriate weight determination.

Since these standards have been found helpful in judging nutritional status in children of school age, the authors have undertaken a similar study on college students. The data used were taken from anthropometric measurements made on almost 4000 students ranging in age from 17 to 24 years and distributed in four colleges as follows:

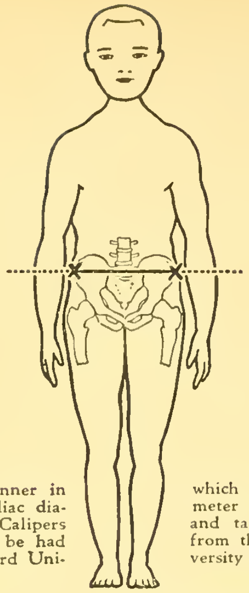
	Men	Women	Total
Stanford University	901	799	1700
University of California	840	712	1552
Menlo Junior College	320		320
San Mateo Junior College		316	316
Total			3888

Wooden sliding calipers were used and the technique was that adopted by the International Anthropometric Agreement described by Martin[16] and Hrdlicka[17]. This group of college students showed less variability in height, diameter, and weight than is evident in younger age groups. Also the relationship between relative width of the body (as measured by the width-length index) and body weight is somewhat different for the college ages than for ages 6—16 years.

Mean width-length indices for ages 17—24 years increase gradually from 157 to 162 for men and from 167 to 172 for women. Data on each student were plotted in terms of unit deviation from the mean index on the ordinate and the unit deviation from mean weight for height and age on the abscissa. Correlations and standard deviations were as follows:

Men	Women
$r = +.343 \pm .032$	$r = +.415 \pm .037$
$\sigma_y = 15.392$	$\sigma_y = 16.616$
$\sigma_x = 7.526$	$\sigma_x = 8.213$

The regression formula $y = \left(r_{xy} \frac{\sigma_y}{\sigma_x} \right) x$ was applied to express weight deviation in terms of width deviation. When x = the unit deviation from mean width-length index for the age-sex group, y = deviation in pounds from mean weight for height and age referred to the medico-actuarial tables and r = the coefficient of correlation between x and y, the values of y are $.70x$ for men and $.84x$ for women. Width-weight tables constructed from these data are shown for women and men between the age of 17 and 24 years in Tables 1 and 2. These tables are divided by age range into four groups with height range in inches given in the left hand column, the bicristal diameter ranges in inches and centimeters shown across the top. A range of seven *normal* weights is given for each height and age depending upon variations in the width of the iliac crest. The central column represents the medico-actuarial table of average weights for age and height. The



Manner in which the bi-iliac diameter is taken. Calipers and tables may be had from the Stanford University Press.

three columns to the right represent respectively 5-7-10 per cent heavier than the central column, while those to the left represent 5-7-10 per cent lighter than the central column. The bicristal diameters heading the various columns were found by applying the regression formula factors. It must be emphasized that all weights given in the tables may be considered as normal, providing they correspond with the stated height and bi-iliac diameter. Thus, in place of denoting appropriate weight as an average or single weight for height, we may express appropriate weight as a range, depending upon individual differences in body build.

These newer standards for determining appropriate weight are already proving helpful to physicians who are working with nutritional problems of late adolescence and early adult life. The patient is often concerned because of rather slight variations from average weight, while the physician is interested in this deviation only as it indicates a disturbance in nutritional status. Any determination of weight as an index of general health should include an appraisal of individual differences which should take into account such variations from average weight as may be due to body build factors. Since weight standards based upon body build recognize individual differences and offer a range of normal weight to account for these differences, they give more accurate and dependable information concerning actual nutritional status.

Summary

1. Determination of appropriate weight as a measurement of nutritional status should be included in assessments of general health.

2. Older standards used for determining appropriate body weight based upon average weight for height and age are inadequate as indications of nutritional status, since they give only average weight and fail to account for individual differences within a normal range.

3. A consideration of individual body build is essential in determining appropriate body weight. Build can be measured satisfactorily by the Width-Length Index.

4. A mathematical analysis of the relation between body build and weight, and a subjective evaluation of its relation to nutritional status has been made on 4000 young adults (college students).

5. Width-Weight tables have been constructed allowing a range of normal weights for each inch of height at age levels between 17 and 24 years, depending upon body build.

6. Measurements of weight based upon these tables give more accurate and dependable information concerning appropriate weight and a safer prediction of nutritional status in young adults than measurements based upon average weight.

These tables offer seven normal weights for each height and age, the variation in norms being based on differences in width of the iliac crests, or bi-iliac diameter.

To Use Table

1. Take age at nearest birthday.
2. Take height at nearest inch.
3. Measure with firm pressure, the greatest width at the crest of the ilium, or bi-iliac diameter, as shown in the diagram below.
4. In the proper age table, opposite the height measurement and under the bi-iliac diameter measurement, will be found the appropriate weight in pounds for this body build. (If a bi-iliac diameter measurement falls between two column readings it is necessary to interpolate.)
   Example: A seventeen year old boy is 69 inches tall. His bi-iliac diameter is 26.4 centimeters. Consequently the appropriate weight for his body build is 141 pounds. Whereas if the same boy had a bi-iliac diameter of 30.4 centimeters, he should weigh 161 pounds.
   Sliding calipers and complete tables may be secured from the Stanford University Press.

TABLE 1
WIDTH-WEIGHT TABLE FOR WOMEN
Age Seventeen to Twenty-four Years
Age Seventeen Years

	Width of	9.5	9.8	10.1	10.8	11.4	11.7	12.0	In.
	Iliac Crest	24.1	25.1	25.8	27.4	29.0	29.7	30.7	Cm.
Height in Inches	59	93	96	98	103	108	110	113	
	60	96	99	102	107	112	115	118	
	61	100	103	105	111	117	119	122	
	62	102	106	108	114	120	122	126	
	63	105	109	111	117	123	125	129	
	64	108	112	114	120	126	128	132	
	65	111	115	118	124	130	133	137	
	66	115	119	122	128	134	137	141	
	67	119	123	125	132	139	141	145	
	68	122	126	129	136	143	146	150	
	69	125	129	132	139	146	149	153	
	70	127	131	134	141	148	151	155	
	71	129	134	137	144	151	154	159	

TABLE 1—Continued

Age Eighteen Years

	Width of	9.6	10.0	10.2	10.9	11.6	11.8	12.2	In.
	Iliac Crest	24.4	25.4	26.1	27.7	29.3	30.0	31.0	Cm.
Height in Inches	60	99	102	104	110	116	118	121	
	61	102	105	107	113	119	121	124	
	62	104	108	110	116	122	124	128	
	63	107	111	113	119	125	127	131	
	64	109	112	115	121	127	129	133	
	65	112	116	119	125	131	134	137	
	66	116	120	122	129	136	138	142	
	67	120	124	126	133	140	142	146	
	68	123	127	130	137	144	146	151	
	69	127	131	134	141	148	151	155	
	70	129	134	137	144	151	154	159	
	71	132	137	139	147	155	157	162	

Age Nineteen to Twenty Years

	Width of	9.7	10.0	10.2	11.0	11.8	12.0	12.3	In.
	Iliac Crest	24.6	25.6	26.3	28.0	29.7	30.4	31.4	Cm.
Height in Inches	60	102	105	107	113	119	121	124	
	61	103	107	109	115	121	123	127	
	62	105	109	111	117	123	125	129	
	63	109	112	115	121	127	129	133	
	64	111	115	118	124	130	133	137	
	65	115	119	121	128	135	137	141	
	66	118	122	124	131	138	140	144	
	67	122	126	129	136	143	146	150	
	68	126	130	133	140	147	150	154	
	69	129	134	137	144	151	154	159	
	70	133	138	140	148	156	158	163	
	71	137	142	144	152	160	162	167	

Age Twenty-one to Twenty-four Years

	Width of	9.8	10.1	10.4	11.1	11.8	12.1	12.4	In.
	Iliac Crest	24.8	25.8	26.5	28.2	29.9	30.6	31.6	Cm.
Height in Inches	60	103	107	109	115	121	123	127	
	61	105	109	111	117	123	125	129	
	62	108	112	114	120	126	128	132	
	63	111	114	117	123	129	132	135	
	64	114	118	121	127	133	136	140	
	65	117	121	124	130	136	139	143	
	66	121	125	128	135	142	145	149	
	67	125	129	132	139	146	149	153	
	68	129	133	136	143	150	153	157	
	69	132	137	139	147	155	157	162	
	70	136	140	143	151	159	162	166	
	71	139	144	147	155	163	166	171	

TABLE 2

WIDTH-WEIGHT TABLE FOR MEN

Age Seventeen to Twenty-four Years

Age Seventeen Years

	Width of	9.2	9.6	10.0	10.7	11.4	11.8	12.2	In.
	Iliac Crest	23.4	24.5	25.3	27.2	29.1	29.9	31.0	Cm.
Height in Inches	61	93	97	99	104	109	111	115	
	62	98	101	103	109	114	116	120	
	63	102	106	108	114	120	122	126	
	64	107	111	113	119	125	127	131	
	65	112	116	119	125	131	134	138	
	66	117	121	124	130	136	139	143	
	67	120	125	127	134	141	143	148	
	68	125	129	132	139	146	149	153	
	69	129	133	136	143	150	153	157	
	70	132	137	139	147	155	157	162	
	71	136	140	143	151	159	162	166	
	72	139	144	147	155	163	166	171	
	73	144	149	152	160	168	171	176	
	74	149	154	157	166	175	178	183	

Age Eighteen Years

	Width of	9.5	10.0	10.2	11.0	11.8	12.0	12.5	In.
	Iliac Crest	24.1	25.3	26.0	28.0	30.0	30.7	31.9	Cm.
Height in Inches	62	102	106	108	114	120	122	126	
	63	107	111	113	119	125	127	131	
	64	111	115	118	124	130	133	137	
	65	116	120	122	129	136	138	142	
	66	120	125	127	134	141	143	148	
	67	124	128	131	138	145	148	152	
	68	128	132	135	142	149	152	156	
	69	131	136	139	146	153	156	161	
	70	135	139	142	150	158	161	165	
	71	138	143	146	154	162	165	170	
	72	142	147	150	158	166	169	174	
	73	146	151	154	162	170	173	178	
	74	151	156	159	168	177	180	185	

Age Nineteen to Twenty Years

	Width of	9.6	10.1	10.4	11.2	12.0	12.3	12.8	In.
	Iliac Crest	24.4	25.6	26.4	28.4	30.4	31.2	32.4	Cm.
Height in Inches	63	111	115	118	124	130	133	137	
	64	115	119	121	128	135	137	141	
	65	119	123	125	132	139	141	145	
	66	122	127	129	136	143	145	150	
	67	126	130	133	140	147	150	154	
	68	130	135	138	145	152	155	160	
	69	134	138	141	149	157	160	164	
	70	138	142	145	153	161	164	168	
	71	141	146	149	157	165	168	173	
	72	145	150	153	161	169	172	177	
	73	148	153	156	165	174	177	182	
	74	152	157	160	169	178	181	186	
	75	156	162	166	174	182	186	192	

Age Twenty-one to Twenty-four Years

	Width of	9.8	10.3	10.6	11.4	12.2	12.5	13.0	In.
	Iliac Crest	24.9	26.2	27.0	29.0	31.0	31.8	33.1	Cm.
Height in Inches	63	114	118	121	127	133	136	140	
	64	118	122	124	131	138	140	144	
	65	121	125	128	135	142	145	149	
	66	125	129	132	139	146	149	153	
	67	128	132	135	142	149	152	156	
	68	131	136	139	146	153	156	161	
	69	135	139	142	150	158	161	165	
	70	138	143	146	154	162	165	170	
	71	142	147	150	158	166	169	174	
	72	146	151	155	163	171	175	180	
	73	151	156	159	168	177	180	185	
	74	155	160	164	173	182	186	191	
	75	160	165	168	178	188	191	196	

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The Physiology of the Colon

*And Clinical Consideration of Carcinoma**

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SINCE Aretaeus described certain large ulcers of the bowel, physicians have written about the varying symptoms and difficulty in making the diagnosis of carcinoma of the colon. In an early period of this literature a plea for an early diagnosis was introduced. This plea has been kept up ever since. It is a most laudable ideal, but can it be realized? Some of the time spent in the repetition of this plea could well have been spent in defining what is meant by an early diagnosis of carcinoma of the colon.

In this study, attempts have been made, so far as possible, to find out why it is that one frequently sees patients who have had symptoms of carcinoma of the colon for a long time and who have not consulted a physician. I have not been misled by what the patients relate in regard to the physicians they have consulted. I have been primarily concerned about the nature of the symptoms, the duration of the present illness, and why the patient had not consulted physicians.

The first requisite in making the diagnosis of any disease is that the physician must see and examine the patient. That is, the patient must be sufficiently aware of his illness to seek relief. In diseases of organs and systems which have essential physiologic functions to perform, a slight derangement of these functions is recognized by the patient and there is no question that relief should be sought. However, in those diseases which do not produce an early derangement of physiologic function or in diseases of those organs or systems which do not have important functions to perform, an early diagnosis, if made, depends on special laboratory procedures, such as the Wassermann reaction, on the detection of anatomic deformity by employment of the roentgen rays, or the recognition of the significance of signs and symptoms which under ordinary circumstances might be considered inconsequential by both the patient and the physician. Carcinoma of the colon is truly a disease of an organ which does not have important functions to perform. No special serologic tests have been developed for detecting the presence of this disease. An early discovery of its presence, therefore, is dependent on the patient's recognizing and consulting the physician about symptoms which at the time of inception do not interfere with any of the routine activities of daily life.

In regard to the physiology of the colon, I have been fortunate in having available for study patients who had had single-barreled ileac stomas established preliminary to more formidable operations. Thus, it was possible to study the function of the isolated colon. Under controlled conditions of intake and output of food and fluids, it was possible to compare the composition of the ileac dejecta and urine of patients who had been subjected to a single-barreled ileostomy with the feces and urine of normal persons. Such a comparison indicates that the colon does not take any part in the digestion of carbohydrates, proteins, or fats. It was found that the ileac dejecta contained more salts (chiefly sodium) and water than did feces. These studies therefore indicate that the outstanding digestive function of the colon is the absorption of salt and water.

The urine of a patient with an ileac stoma contains less salts (mainly sodium) than does normal urine. That is, the kidney compensates for the loss of salts which occurs through the ileac dejecta.

An analysis of the excreta obtained from these isolated human colons would indicate any possible excretory functions of this organ. The composition of these excreta shows that the human colon does not excrete any significant quantity of iron, calcium, or phosphorus.

The function of the human colon therefore can be briefly summarized as follows: (1) storage and ejection of the alimentary refuse, (2) absorption of salt and water, and (3) excretion mostly of mucus which acts as a lubricant. None of these functions is vital; the body may be deprived of the colon and still maintain metabolic equilibrium. Apparently, the most profound physiologic change produced by loss of colonic function is the loss of salt and water, which can be and is compensated for by the kidneys.

Physicians frequently see patients who have advanced carcinoma of the colon which has been present for months, and occasionally for more than a year. These patients have not previously consulted a physician. This study, therefore, was primarily concerned with the symptoms as related by the patient, the order of appearance and the nature of the symptoms which finally caused the patient to consult a physician or to come to the clinic. Since the usual study of carcinoma of the colon includes the rectum and sigmoid flexure, it is necessary to state that lesions which were beyond the reach of the sigmoidoscope and distal to the terminal portion of the ileum were not included in this study.

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In order to facilitate description, the symptoms were divided into three groups: (1) local, (2) reflex, and (3) those other than gastro-intestinal. By local symptoms is meant discomfort referable to the region of the colon involved. For instance, in carcinoma of the cecum, symptoms which occur in the right lower abdominal quadrant are referable to the site of the lesion. An example of reflex symptoms is that if a patient with carcinoma of the cecum has pain in the left upper abdominal quadrant, this pain is reflex in origin. Symptoms other than gastro-intestinal include such complaints as loss of weight, weakness, and fever. It was found that the first symptom of the disease was local in more than 40 per cent of cases. Reflex symptoms were the next most prominent and seemed to increase as the more distal segments of the colon were involved. Symptoms other than gastro-intestinal were more frequent in carcinoma of the right half of the colon than they were in the left. Pain in the right side of the abdomen was present and was the initial symptom in 36.8 per cent of the cases of carcinoma of the right half of the colon. Lesions which were situated in the left half of the colon, produced pain as an initial symptom in the left side of the abdomen in 31.1 per cent of cases. It was found that the presence of blood in the stool as a first symptom was unimportant in all except those cases in which lesions involved the sigmoid flexure. A very small percentage of patients first consulted a physician on account of a lump in the abdomen, which they themselves had discovered. Acute intestinal obstruction as a first symptom was insignificant except in cases in which lesions involved the great flexures of the bowel. In those cases in which the initial symptom was reflex, it was found that 14.8 per cent of the patients who had cecal lesions had had, as the initial symptom, attacks of generalized abdominal pain. This pain usually had not been severe. It often had not concerned the patient more than to create a desire for a purgative. However, in a few cases the pain had been severe and had required the administration of opiates for relief, and had been of enough concern to warrant an exploratory operation. In fact the justly morbid fear of appendicitis is the reason patients who have carcinoma of the colon are occasionally subjected to exploratory laparotomy. Generalized abdominal pain was the most frequent initial symptom in lesions of the splenic flexure. These attacks of pain were intermittent and almost always were the first intimation of a lesion in this situation. It is important to state that a small percentage of patients who have carcinoma of the colon have localized pain in regions of the abdomen far removed from the site of the lesion.

In the literature on carcinoma of the colon, much has been written about the change in bowel habits as the first symptom of the disease. In the cases we have seen at the clinic, many patients had voluntarily instituted a regular regimen of laxatives; therefore, the diagnostic value of this symptom is impossible to evaluate. However, it might be argued that the feeling which caused these patients to take laxatives was an indication of a change in bowel habits.

Carcinoma of the colon is most difficult to recognize in those cases in which the patients consult the clinician on account of symptoms not directly referable to the gastro-intestinal tract. These symptoms may be grouped under the headings of loss of weight and weakness. About 15 per cent of patients with carcinoma of the colon consult a physician on account of these symptoms. Loss of weight, although not always complained of, was the most frequent and constant of all symptoms of carcinoma of the colon.

It is just as important to know the duration of symptoms of carcinoma of the colon as it is to know the initial symptom. It was found that 25.8 per cent of those with cecal lesions, 15.5 per cent of those with lesions of the ascending colon, 10.5 per cent of those with lesions of the hepatic flexure, 10.8 per cent of those with lesions of the transverse colon, 6.3 per cent of those with lesions of the splenic flexure, 5.7 per cent of those with lesions of the descending colon, and 20.9 per cent of those with sigmoid lesions had had symptoms for more than eighteen months. Lesions of the right half of the colon are definitely of longer duration than those of any other segments of the bowel.

It is thus evident that a great number of patients who have carcinoma of the colon have had symptoms referable to the colon for many months. These symptoms have been ignored or have been thought to be unimportant by the patient. An attempt was made to find out what finally forced these patients to consult a physician. The result of this analysis showed that abdominal pain was by far the most common symptom which finally brought them to the doctor. In fact, about 85 per cent of the patients who had carcinoma of the colon consulted a physician or were brought to the hospital on account of pain. As a rule, a patient completely ignores all other symptoms. If patients who have carcinoma of the colon wait for the appearance of pain before they come to the physician, then one is going to continue to see many of these patients at a time when the lesions have progressed to a stage beyond any hope of more than palliative relief.

Unusual manifestations of the clinical symptoms at times will be observed in any disease.

Therefore, it will be of sufficient interest to present some unusual manifestations of carcinoma of the colon which were observed during this study. As a rule, anemia is more pronounced in carcinoma of the right half of the colon. There are, however, very marked exceptions to this rule. A man, aged 60 years, had had pain and a palpable mass in the region of the cecum for more than a year. He was not anemic, and there had not been any loss of weight. It is interesting to contrast this patient with another who had carcinoma of the cecum. The latter had lost 37 pounds (16.8 kg.) in four weeks and the value for the hemoglobin was 6 gm. per 100 cc. of blood. There was one patient who had had recurring pain and soreness in the region of the left kidney for six months. Although roentgenologic examination revealed an obstructive lesion of the descending colon, the possibility of hypernephroma was still entertained. Pain in the left testis was present in several cases of carcinoma of the sigmoid flexure. Perforating lesions of the colon may present all the signs and symptoms of an acute inflammation in the abdomen. They may be indistinguishable from those symptoms often observed in diverticulitis of the colon. One patient who had a perforating carcinoma of the sigmoid flexure also had diverticulosis. The pain in carcinoma may be severe enough to require administration of opiates for relief. Such severe pain is often the result of the intussusception of a polypoid carcinoma. Exploratory laparotomy revealed that one patient who came to the hospital on account of acute severe pain in the abdomen had a polypoid lesion of the cecum which had intussuscepted to the midtransverse colon. In two cases in which operation was performed for strangulated inguinal hernia, removal of the contents of the inguinal hernias revealed a carcinoma of the colon which was incarcerated in the hernial sac. The carcinoma undoubtedly had been responsible for the strangulation.

A very common symptom in carcinoma of the colon is that lifting a heavy weight or quickly changing position produces a strange pain-like discomfort in the abdomen. There may be a constant loss of small amounts of blood each day but a sudden massive hemorrhage is not common. In this series of cases there were eight patients who had had one or more massive rectal hemorrhages. Two of these patients had lesions of the splenic flexure, two had lesions of the cecum, two had lesions of the ascending colon, and two had lesions of the transverse colon. Now and then symptomless carcinomas of the colon are accidentally discovered during routine examination and these have been called "silent carcinomas." The finding of such carcinomas indicates that carcinomas of the colon possibly may have been present for some time before symptoms occurred. Clinical symptoms of carcinoma of the colon are probably always the result of complications rather than the presence of the disease. To illustrate this type of carcinoma, a man, aged 34 years, presented himself for a general physical examination. He had not had any symptoms. He looked and appeared healthy. During the course of the examination a mass was felt in the region of the umbilicus or just below it. Roentgenologic examination disclosed deformity in the transverse colon which was found to be the result of a large nonobstructing carcinoma which had metastasized to the liver. Microscopic examination revealed that the carcinoma was highly malignant.

The actual distribution of carcinoma of the colon in various age and sex groups serves to indicate the common occurrence of the disease. It more commonly affects those in the sixth decade, the average age being around 54 years. Those who had carcinoma of the colon as early as the second decade of life also had a disseminated polyposis of the colon with carcinoma arising in a polyp. In all age groups men were more commonly affected than women, the ratio being almost 3:1.

General physical examination revealed that the appearance of a great number of these patients did not indicate the gravity of their illness. Eighteen and one-half per cent of patients who had lesions of the right half of the colon and 60 per cent of those who had lesions of the descending colon group appeared healthy. Palpable tumors at the site of involvement were most common when the lesions were situated in the right half of the colon. There is always a possibility that the situation of the tumor in the abdomen may be widely separated from the anatomic portion of the intestine involved. The greatest and most unexpected disparity in respect to situation of the tumor was seen in the lesions at the cecal region. Several of these were situated in the left lower quadrant of the abdomen. In 59.8 per cent of the cases of carcinoma of the colon the patients had palpable tumors in some part of the abdomen. Abdominal tenderness seemed to occur only in cases in which there were inflammatory reactions about the tumor or in which there were varying degrees of perforation. A palpable liver is often present, but unless it is greatly enlarged or nodular this finding is of no definite significance. Abdominal distention and visible peristalsis also are associated with obstruction.

Much has been said about the degree of the anemia in lesions of the right half of the colon in contrast to lesions of the left half of the colon. In the absence of better theories to explain this known fact, authors have alluded to the possibility of absorption of toxins by the right half of the colon. So far as is known, no one has computed the average duration of the disease in months and the average value for the hemoglobin in cases of lesions situated in the right and left halves of the colon. If such computations are made, the differences in degree of anemia can then be explained largely on the basis of the longer duration of lesions of the right half of the colon. The average duration of lesions of the right half of the colon is 13.3 months, whereas, the average duration of the lesions of the left half of the colon is 9.9 months.

During this review the impression was gained that these patients had been remarkably free of illness. Constipation was infrequent; it did not occur in more than 22.9 per cent of the cases. The incidence of rectal bleeding and indefinite abdominal pains prior to the present illness was also insignificant. Previous operations for appendicitis, disease of the gallbladder, or inguinal hernia were no greater than they are among the general population. Operations for the present illness had been most frequent in cases in which the cecum was involved (13.0 per cent). In many of these cases appendicitis had been suspected before operation. It is interesting to note that there had been more operations for the present illness than had been done for all previous diseases in the past. In from 2 to 6 per cent of the cases, conditions at the time of operation were such that it was impossible to be sure of the true nature of the lesion and the diagnosis of an indeterminate tumefaction was made.

At times, a complicating disease may be more serious to the patient than carcinoma of the colon. Of the serious complicating diseases in this series of cases, urinary obstruction and heart failure were the most common. From 16 to 35 per cent of the patients had arteriosclerosis or prostatic hypertrophy which had produced some impairment of renal or cardiac function. The next most important complication was obesity. In a combination of carcinoma of the colon and prostatic obstruction, it is difficult in some cases to determine without a cystoscopic examination whether there are two separate diseases or a direct extension of the carcinoma of the rectum or colon.

In recent years much has been written about the hereditary factors of carcinoma. Medical literature intended for "educating the lay public" may have served a good purpose but has gone further; it has caused a great deal of unnecessary concern among the families of many patients who have carcinoma. In a review of a large number of family histories of patients who have carcinoma of the colon and patients without carcinoma, it has not been possible to find that there is an appreciable difference in the incidence of carcinoma in the two groups of patients. However, there are families in which there seems to be evidence of the presence of hereditary factors. In the family of one patient (fig. 1), both parents, one maternal aunt, two brothers, and two sisters had died of gastro-intestinal carcinoma. Experience teaches that the expectancy of carcinoma among the other brothers and sisters of this family is definitely greater than it is among the general population. If this family is contrasted with the family in figure 2, an approximately equally large family without carcinoma, it is apparent that one is not justified in permitting a great amount of anxiety to prevail in the minds of the members of the family of most of the patients who have carcinoma of the colon.

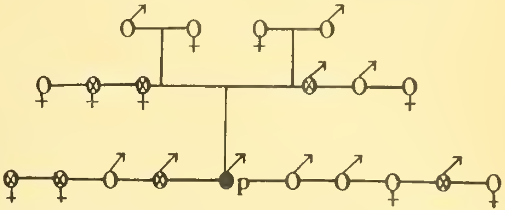

Fig. 1. Man, aged 30 years, with carcinoma of colon; mother, father, maternal aunt, two sisters, and two brothers died with gastro-intestinal carcinoma.

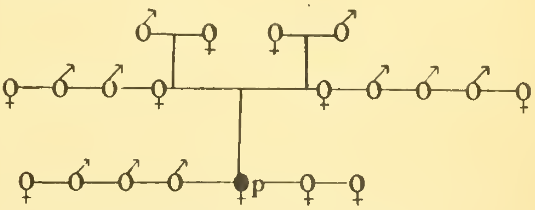

Fig. 2. Woman, aged 28 years, with carcinoma of the colon, who had a negative family history for carcinoma.

Summary

The colon has no vital physiologic functions to perform. Its main functions are the absorption of salt and water from the material delivered to it from the ileum, and to prepare and store the alimentary dejecta for disposal by expulsion from the body. It has been intimated that carcinoma of the colon is symptomless, that the usual signs and symptoms considered to be the result of the disease are rather the signs and symptoms of the complications. About 15 per cent of patients who have carcinoma of the colon consult the physician for loss of weight and weakness, and have no specific symptoms referable to the gastro-intestinal tract. The greater part of the remaining 85 per cent of such patients do not consult the physician for their illness until pain or abdominal discomfort are present. It has been further intimated that an early diagnosis of carcinoma of the colon has not been defined. To approach the ideal of an early diagnosis of carcinoma of the colon, whatever this may be, will require a most careful consideration of all symptoms referable to the gastro-intestinal tract distal to the stomach by both the patient and physician if the patient is past the age of 40 years. Intestinal symptoms are not enough. Carcinoma of the colon should be included in the differential diagnosis of all conditions which produce loss of weight and weakness which cannot be adequately explained otherwise. Rectal bleeding is an important symptom but is of little consequence in colonic lesions above the sigmoid flexure when it is compared with varying degrees of abdominal discomfort and loss of weight.

The Injection Treatment

Of Large External Inguinal Rings Without Hernia

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THE injection method has proved to be an especially valuable adjunct in the sclerosing and tightening of large relaxed inguinal rings. In many individuals a definite hernia is not palpable and no impulse thru these openings can be made out by the examining finger, yet examination of the external inguinal ring reveals enlargement and relaxation of this structure, a condition which is no doubt in many instances the precursor of definite inguinal hernia. Whether this condition is congenital or acquired, and whether it bears a constant relationship to the later development of hernia is open to dispute. At any rate problems in treatment are the same.

The presence of relaxed inguinal rings in the absence of definite hernia is one of great concern when question comes of the employment of these individuals in industrial positions. With the growing tendency of employers to require a rigid physical examination prior to acceptance as employees, there have been found individuals as described above. There is no hernia present, yet from the size of the external inguinal ring one can say that a potential hernia exists. Under the existing industrial compensation laws of many states the chance is very great that the employer will later be forced into the financial responsibility of medical, surgical and hospital fees as well as into payment of part or all of his wages while the patient is away from work, and this fact has rightfully taught a degree of wariness in accepting such an employee with large or relaxed inguinal rings. The same is likewise true of the civil and military services and many times these unfortunate individuals are of real value to their employers or to the government, yet because of this relatively minor defect they cannot be accepted for service.

Formerly, in cases such as these before acceptance for employment could be made, treatment consisted in many instances of advising the patient to wear a truss, but in most cases it was necessary to insist upon surgical repair of the hernia. Either of these were rather drastic measures to remedy a defect which was, after all, only a potential one as far as development of hernia was concerned and not evaluated as to its exact future status.

It is true that the likelihood of the future development of a hernia in these individuals is especially great in the male, since a number of factors operate to produce this condition. With advancing age physical activity is decreased and the abdominal musculature becomes relaxed and weakened. Likewise obesity in varying degrees is common, thus further predisposing to weakening of the abdominal wall. Finally in a high percentage of males urinary obstruction or constipation or both supervene. Then, in a short time with the additional straining and increase of intra-abdominal pressure consequent to such conditions any point of weakness in the abdominal wall will likely give way and lead to the formation of hernia.

With the advent of the sclerosing type of treatment of herniae, a simple and effective means of therapy of the above described condition was made available. After sufficient trial, this method was found to be exceptionally adapted to the purpose of narrowing of the external ring. The end results reveal a restoration of anatomical conditions which cannot be distinguished from normal external inguinal rings so that most of these individuals could be accepted for employment as far as the question of potential inguinal hernia was concerned. Ultimately, without doubt, the incidence of definite hernia should be materially reduced so that these patients receive considerable benefit regardless of requirements from an industrial standpoint.

Technique of Treatment

Since in these cases no herniation thru the internal inguinal ring is demonstrable and there is present merely a large external inguinal ring thru which no impulse can be palpated, a truss is not necessary. Furthermore the truss is not advisable since it is only an additional source of discomfort and it cannot possibly be of benefit. Using the technique previously described for indirect inguinal hernia, the first injections should be made about the internal ring since it is impossible to determine the size of this structure, and it is very advisable to be certain as to its competency and ability to withstand the possible future development of hernia. If a hernial sac be present, and in the condition described there is no way of being certain of this fact, there exists additional reason for narrowing the internal ring. In the process of accomplishing this purpose the potential hernial sac if present is practically always obliterated, as described in a separate communication.[1] After three or four injections have been placed about the internal ring, a similar number should be given along the inguinal canal and about the margins of the external ring. These injections should be small in amount and given frequently, such as 1.0 cubic centimeter of sodium psylliate or a tannic acid alcohol solution every other day. If the procedure is done in this manner there is little or no pain produced and likewise no disability follows. After 16 or 18 days, a rest of several weeks is given and at reexamination the external ring is found to be firmly and tightly narrowed down so that it usually closely approaches the normal as far as palpation can determine. During the period of scar contraction nodular eminences and irregularities are present along with a thickening of the edges of the external ring, but these recede leaving a perfectly smooth, strong, non-tender margin to the fascial edges. The number of injections necessary varies considerably depending upon the size of the external ring and the extent to which narrowing is desired. An individual variation is also present in the thickness of the fascial edges of the external ring. In thin asthenic non-athletic types, it is likely to be weak, relaxed, sharp and thin, while it is more often the opposite in heavily muscled individuals. Therefore the degree of thickening and sclerosis desired varies considerably, and consequently the number of injections necessary will differ. As an average in 32 cases 7.4 injections for each individual were necessary.

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Complications following injections for the purpose herewith described were not encountered altho theoretically they are the same as for treatment of actual hernia. Likewise, contraindications as well as criticisms are similar and are elsewhere described.[2]

In summary it may be stated that in the injection method there exists a simple and efficient means of narrowing and tightening large or relaxed inguinal rings. This condition may be symptomless and unaccompanied by evidence of rupture, yet potentially there exists the site of a future hernia. This is of especial importance in industrial practice where many employees are unable to pass a physical examination allowing acceptance for employment. Previously, the only recourse as to successful treatment of this condiion was surgical repair, a method which often was not justified since no proof exists that these individuals invariably develop hernia in this location.

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Anemias in College Women

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IN ANY discussion of anemias normal standards must be kept in mind. Wintrobe[1] of John Hopkins reported what he considers standards which may now be accepted as normal on the basis of reports from various authors in different sections of the country, based on reliable technique. The standards given by Wintrobe for women are: a mean of 4.8 million red cells per cubic millimeter with a normal range of 4.2 to 5.4 millions; a mean of 14.0 grams of hemoglobin per 100 cc. of blood with a normal range of 12 to 16 grams and 42 cc. volume of packed cells per 100 cc. with a normal range of 37 to 47 cc. The standards for men are a little higher. He believes 14.5 grams of hemoglobin per 100 cc. of blood should be employed as the equivalent of 100 per cent hemoglobin, although he thinks it is much better to state hemoglobin in grams per 100 cc. In an analysis of blood findings of young adults from all parts of the country he was unable to demonstrate any significant variations in findings from various sections of the country or any significant variations at different ages of adults in good health.

There has been a definite change in the classification of anemias in recent years as more accurate methods have been developed for various measurements of the red cell and its hemoglobin content. Instead of dividing anemias into two main groups, the primary and the secondary, and then dividing the secondary anemias according to known etiological factors, they are now classified according to morphologic criteria or etiologic criteria and still more recently into groups which include both. Thus the morphologic classification divides the anemias according to the size of the red cell and its hemoglobin content, such as the normacytic and normochromic macrocytic and hyperchromic, hypochromic, etc.

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*From the Student's Health Service, University of Minnesota, Minneapolis, Minnesota. Read before the North Central Section of the American Student Health Association, Northfield, Minnesota, May 23, 1936.

In Haden's[2] classification of the causes of anemia he states that there are two main factors: (1) increased blood loss from either bleeding or accelerated blood destruction; and (2) decreased blood formation from either depression of marrow function or deficiencies in specific substances necessary for normal red cell formation.

Wintrobe[3] offers a classification combining both etiologic and morphologic data, but he points out that very accurate technique is required and that in some cases there may be more than one etiologic factor so that in all cases rigid classification is not possible.

A type of anemia in women which has been receiving increased attention since 1931 with numerous papers reported since then is chronic idiopathic hypochromic anemia. It is described as a disease of middle-aged women, the greatest incidence being found between the ages of 40 and 50. Although some regard it as a separate entity, Castle and Minot[4] state that similar findings are present in other hypochromic anemias. They state that gastric anacidity, fatigue, poor appetite, mental instability, vague gastro-intestinal complaints, are the common symptoms. The physical signs are rather constant: pallor of the mucous membrane, atrophic or smooth tongue (usually the tongue is not sore), and finger nails which may be concave, brittle, and fail to grow normally. Enlargement of the liver and spleen have been reported as frequent. The gastric anacidity persists even after histamine injection in a high proportion of cases.

Watkins[5] of the Mayo Clinic divides the chronic secondary anemias into three general groups: (1) those due to hemorrhage; (2) those due to organic lesions; and (3) after all known factors have been excluded, a group which he calls idiopathic secondary anemia. He then further divides this last group into four sub-groups according to differences in the blood picture, and includes the chronic idiopathic hypochromic anemia as one of these.

Routine Hemoglobin Determinations in University Women

A study has been made of hemoglobin determinations in women students of the University of Minnesota as found on routine periodic health examinations.

In a series of 5,101 periodic health examinations on women, 1,204 had a hemoglobin under 75 per cent (Sahli); 3,339 were between 75 per cent and 84 per cent; and 558 were 85 per cent and above. The average was 78.76 per cent. The numbers of cases and percentages in the various ranges are given in Table I.

These three groups were then studied with relation to certain health habits which might affect the hemoglobin, and certain physical findings to determine whether or not they might be either the cause or effect of the anemia. No significant differences in diet or sleep were noted in the three groups. The average age in the low hemoglobin group was a little higher. The relation of age and hemoglobin is shown in Table IV. The average blood pressure was slightly lower in the low hemoglobin group, but probably not significantly so. The incidence of underweight was higher, and that of overweight lower in the low hemoglobin group. The incidence of septic tonsils was not significantly different and constipation occurred somewhat more frequently in the low hemoglobin group. Fatigue was significantly increased in this group, especially as compared with the high hemoglobin group. Analysis of the menstrual histories showed a slightly higher incidence of irregular menses and amenorrhea in the low hemoglobin group. Tables II and III contain the data for some of these factors.

Survey of Anemias in University Women

A series of 157 women patients treated at some time for anemia at the Health Service in the last seven years during the regular school year were studied in an attempt to analyze some of the factors involved in these anemias. The records are not very complete in some cases with only a few observations being given, but no effort at selection was made, as one of the objects of the study was to find out how much or how little had been done in studying these patients.

The average age was 22.9 years in 151 cases. The range was 16 to 52 years. One hundred and one, or 66.8 per cent were under 23 years or in the college age group. Fifty were 23 years or older, but only 14 were over 30 years.

The average hemoglobin was 65.35 per cent (Sahli) with a range of 40 to 81 per cent. The average red cell count was 3.86 millions per cubic millimeter in 128 cases with a range of 2.65 to 5.01 millions. The average color index was .85 with a range of .5 to 1.25. Thirty-nine had a color index below .8, while only four were above 1.0. Differential counts were done in 91 cases and were grossly normal in 61. A report on the examination of the blood smear was available in 58 cases. The most common findings were: hypochromasia in 29, anisocytosis in 35, poikilocytosis in 25, anachromasia in 25, and polychromasia in 10. A shift to the right in the neutrophile picture was mentioned in 11 cases. Various changes in the white blood picture were found, but did not occur with any frequency to admit of classification. Toxic changes in the neutrophiles were reported in 15 cases and functional alterations in the lymphocytes in eight.

The average blood pressure (from a recent physical examination or taken when patients were seen in the dispensary) was 119.6 systolic and 72 diastolic in 133 cases. The records indicated that 70 cases were of normal weight, although the percentage of standard was given in only 49 with an average of 97.2 per cent; 31 were stated to be underweight with an average of 84.95 per cent of the standard in 24 cases; and 14 were overweight with an average of 116 per cent. In these studies students were considered underweight only if they were 10 per cent or more under the standard and overweight if 10 per cent or more above. No recent weight was available in 40 cases.

Evaluation of the role of diet was made on the basis of the history on the most recent physical examination or from a report by the patient when seen for the anemia. It is quite probable that some of these reports were not accurate, but 123 or 79.9 per cent were adjudged adequate, and 14 or 9 per cent inadequate, either as to total intake or in certain specific substances. Seventeen or 11 per cent were questionably adequate.

Physical findings or diagnoses of abnormal conditions were studied and a wide variety noted, many of which were probably unrelated to the anemia. Forty-seven or 30-1 per cent had no significant physical findings. Functional systolic murmurs were found in 16 cases, chronically infected tonsils in 19, and enlarged tonsils in 6 cases. The spleen was enlarged in 4 cases. One of these was in a girl with congenital hemolytic anemia and another in a girl on whom a definite diagnosis was not made at the Health Service and who was not under our observation very long. It was learned later that she developed a marked splenomegaly with generalized lymphadenopathy and a severe anemia. Recurring osteitis of the tibia was found in one case. Of two patients with chronic valvular heart disease, one was a student who probably had her cardiac infection while attending school, and she illustrates very well the importance of examining carefully every person who comes in with an unexplained anemia. The anemia in this instance was probably largely the result of the endocarditis. One girl had advanced glomerular nephritis and the anemia was severe and characteristic of the type associated with that disease. She died within two years after last seen here. Three patients have or had had uterine fibroids. In one case the anemia was due to gastro-intestinal bleeding of undetermined origin but probably due to a duodenal ulcer.

A smooth tongue was not often recorded but it is a characteristic finding in most cases of hypochromic anemia. The atrophic and brittle finger nails were seen in only one patient, a woman of 39 years who had a rather severe hypochromic anemia probably of long duration.

TABLE I
HEMOGLOBIN DETERMINATIONS (SAHLI) IN 5,101 UNIVERSITY WOMEN

	No. of Cases	
Hemoglobin 55-64—	70 cases	1.4%
Hemoglobin 55-69—	225 cases	4.4%
Hemoglobin 70-79—	2726 cases	53.4%
Hemoglobin 70-84—	4318 cases	84.7%
Hemoglobin 85-99—	558 cases	10.9%

Average hemoglobin—78.76%

TABLE II
BLOOD PRESSURE AND HEMOGLOBIN

	No. of Cases	Average Systolic Blood Pressure
Hemoglobin under 75%	1204	117.491 ± .210
Hemoglobin 75-84%	3339	118.109 ± .130
Hemoglobin over 84%	558	118.896 ± .302
Total	5101	

Basal metabolic rates were recorded in 20 cases of which 12 were below the normal range and 6 were normal or above. Of the 12 who were below normal, 6 had hemoglobins below 65 per cent and in four the color index was below seven. Analysis of the gastric contents was recorded in only three patients. Free acid was present in two and practically absent in one, the girl with congenital hemolytic anemia.

The symptoms complained of by the group were varied. Fifty-six, or 35.7 per cent, had no symptoms recorded. Fatigue of some degree was frequent. Sixty-three, or 51.2 per cent of 123 patients gave a history of fatigue. In 29 cases it was not stated whether fatigue was present and in 14 cases or 11.4 per cent it was questionable, *i. e.*, not stated definitely but from examination of the records it seemed likely that it was present. Gastro-intestinal complaints were not frequent, only 10 having such complaints stated. It is possible that more detailed questioning of the patients might have elicited some of these symptoms. Chronic constipation was noted in 11, nervousness in 8, and dyspnoea on exertion in 20 or 12.7 per cent. Backache was present in 5, and headache in 5. Thus fatigue and dyspnea were the two outstanding symptoms found in this group.

An analysis of some of these factors was made in those whose hemoglobin was below 65 per cent. Fifty-four, or 38 per cent of the 157 were in this group. Weights were recorded as follows: 11 or 24.4 per cent were underweight; 29 or 64.4 per cent were of normal weight, and 5 or 11.1 per cent were overweight. Twenty-six or 54.2 per cent noted fatigue and in 7 this was questionable and undetermined in 12. The fatigue was marked in 7 or 14.6 per cent.

In view of the fact that no definite cause of the anemia could be found in many of these cases, it was decided to analyze the menstrual histories rather carefully, since menstrual abnormalities have been stated by many authors to occur in large proportions of patients with hypochromic anemia.

Haden and Singleton[6] reported a group of 34 cases of idiopathic hypochromic anemia of which 29 menstrual histories were studied. Only 12 had normal periods. Pelvic examinations were negative and they state that the menses usually returned to normal on treatment of the anemia.

Concerning the blood loss during menstruation, Barer, Fowler, and Baldridge[7] of Iowa reported findings in 50 normal women. They found that the blood loss ranged from 9.3 cc. to 207.8 cc. with a mean of 36.7 cc. Much larger amounts were lost by patients with hypochromic anemia. They state that a loss of 78 mg. of iron at each period would necessitate a daily iron retention of 2.8 mg., and their studies indicate that such a retention is unusual, and they believe this accounts for some cases of idiopathic hypochromic anemia.

Leverton and Robert[8] in a recent report of careful determinations of the hemoglobin and red cell counts in four normal women through several menstrual cycles were unable to find any variations in these counts which could be interpreted as being due to the effect of any phase of the cycle.

Wright[9] reported 12 cases of definite pelvic pathology in 28 women with anemia and anacidity.

In this series of anemias (157 cases), 76 had some abnormality of the menstrual period at some time. Of these 58 were due to disturbances in the flow and 18 to dysmenorrhea of some degree only. Dysmenorrhea was present with other disturbances in a number of them. Thus, 43.9 per cent had some disturbance of the menstrual flow at some time. This incidence was a little higher in the group with low color indices—47.4 per cent. The incidence of dysmenorrhea was 26.1 per cent, menorrhagia 3.3 per cent, amenorrhea was present in two cases besides two due to surgery. Those two were not included in the menstrual disturbances. The other disturbances in the flow were periods of prolonged flowing for six days or more, irregular periods, scanty periods, or periods with two or three days of definitely profuse flow. In some cases a recently profuse

TABLE III

RELATION BETWEEN VARIOUS HEALTH HABITS AND PHYSICAL FINDINGS AND THE HEMOGLOBIN

	Hemoglobin under 75		Hemoglobin 75-84		Hemoglobin 84	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Diet						
Adequate	1105	93.1 ± 0.5	3140	94.2 ± 0.3	517	93.3 ± 0.7
Inadequate	82	6.9 ± 0.5	194	5.8 ± 0.3	37	6.7 ± 0.7
Total	1187		3334		554	
Sleep						
Adequate	1032	86.0 ± 0.7	2797	84.1 ± 0.4	466	84.4 ± 1.1
Inadequate	168	14.0 ± 0.7	530	15.9 ± 0.4	86	15.6 ± 1.1
Total	1200		3327		552	
Septic Tonsils	120	10.0 ± 0.6	301	9.0 ± 0.3	61	10.9 ± 0.9
Constipation	81	6.7 ± 0.5	156	4.7 ± 0.3	24	4.3 ± 0.5
Fatigue	118	9.8 ± 0.6	228	6.8 ± 0.3	24	4.3 ± 0.5
Weight						
Underweight	408	34.6 ± .9	969	29.8 ± 0.5	157	28.7 ± 1.3
Normal	636	54.0 ± 1.0	1189	58.1 ± 0.6	309	55.0 ± 1.4
Overweight	134	11.4 ± 0.6	393	12.1 ± 0.4	89	16.3 ± 2.1
Total	1178		3251		547	

TABLE IV
RELATION OF AGE AND HEMOGLOBIN

Age	Hemoglobin under 75		Hemoglobin 75-84		Hemoglobin over 84	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
—18	27	2.2	102	3.1	17	3.1
19-22	834	69.4	2371	71.2	390	70.3
23-29	268	22.3	640	19.2	115	20.7
30+	72	6.0	218	6.5	33	5.9
Total	1201		3331		555	

period had been present in girls whose previous periods had been normal. Of those who had low basal metabolic rates, only three had normal periods, so that nine of these abnormal periods were associated with low basal metabolic rates. Since there are no figures available as to the incidence of such disturbances in the periods of normal women, it is not possible to state here whether this incidence of disturbances of menstrual flow is related to the anemia. However, in a few cases the history of prolonged disturbance of menstruation with a coincident anemia was a striking feature and it was by no means certain in some of these cases that the profuse flow preceded the anemia. Only further study will indicate which comes first.

Treatment

In all cases, of course, the cause should be sought and removed if possible. To bring the blood back to normal, this alone may be sufficient or iron therapy may be used in addition. In most hypochromic anemias the response to iron is excellent. In severe types liver therapy along with iron to hasten the blood response may be used. The type of iron preparation makes little difference, provided the dosage is sufficient. If that is satisfactory, then the cost to the patient, tolerance, and convenience are the remaining factors to take into account.

The optimum daily dose of metallic iron, according to Bloedorn[10] should be 1 to 1.5 grams daily. Blaud's pills or ferrous carbonate and iron ammonium citrate require large dosages (4 to 6 grams daily). Either may cause gastro-intestinal difficulties, such as constipation or diarrhea. Ferrous sulphate in a dose of 9 grains daily is very satisfactory, non-irritating, and convenient to the patient in the enteric coated three-grain tablet now available. Twelve grains daily may be given if necessary. Reduced iron, which contains 90 per cent iron, is preferred by some. The optimum daily dose is 1.5 grams.

The diet should contain adequate amounts of protein, especially muscle meat and liver. The green vegetables are of value for other elements as well as iron. Peaches and apricots are of special value as apparently they have additional effect in the synthesis of hemoglobin, and it makes no difference whether they are fresh, dried, or canned. Any faulty health habits should, if possible, be corrected.

Comment

It is apparent that anemias in college women are often treated without a complete study of the blood to determine the nature of the anemia and without an attempt to determine the etiology and remove the cause. It is true that in many cases the treatment of the anemia alone seems to give satisfactory results but if more information is to be obtained concerning the onset of idiopathic hypochromic anemia, a careful study in this age group offers hope of finding out what the etiology of that type of anemia may be. Its relation to the chlorosis of older authors has been discussed by various writers and it has been stated by many that these women often give a history of having been anemic for a long time or recall having taken iron for some reason when younger. One cannot help but think that the onset of this anemia may often be at a much younger age, although the full clinical picture does not appear until middle age. The symptoms and findings in the group studied here suggest that possibility.

Since hypochromic anemia is much more frequent in women than in men, the question has been raised whether or not the modern woman has a sufficient daily iron intake to offset the chronic loss of blood from menstruation. Certainly more objective data are needed concerning the diets of young women, especially as regards mineral intake, and also more information concerning the amount of blood lost during what are often called normal menstrual periods. The histories of these patients suggest that greater care in detail is necessary in obtaining accurate menstrual histories. The role of other endocrine factors is intriguing. It may be that in the inter-relation of these factors iron intake, menstruation, and metabolic disturbances and possibly other endocrine factors will be found the explanation of many mild and moderately severe anemias of this age group which, if not corrected, lead to the idiopathic hypochromic anemia of middle age. It is of interest to note that upon routine examinations while only a small percentage of University girls are definitely anemic, approximately half of them are below the average. The presence or absence of free hydrochloric acid in anemias of the younger age group in a large series should certainly be determined.

Summary

1. Analysis of the hemoglobin determinations in a large series of University women on routine examination shows that only a small proportion, 5.8 per cent, had a definite anemia and only 1.4 per cent an anemia of moderate or severe degree. Approximately 50 per cent were below the average but within the normal range.

2. In the low hemoglobin group there were significantly more girls who were underweight and who gave a history of menstrual disturbances and fatigue than in the high hemoglobin group.

3. One hundred and fifty-seven cases of anemia were studied and showed that the great majority of anemias in this group are of the hypochromic

and normochromic types with approximately one-fourth being definitely hypochromic.

4. Approximately one-third of these patients had no significant physical findings or symptoms. Fatigue, dyspnea, on exertion, and menstrual disturbances were the outstanding symptoms.

5. Detailed studies with careful technique of the blood findings and routine analysis of gastric contents in anemic patients of this age group together with careful histories especially as regards diet and menstruation are needed to determine the causes of anemia in young women.

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BOOK NOTICES

MEMORIAL VOLUME:
LeROY CRUMMER, M. D.

A Doctor's Odyssey, by A. GAYLORD BEAMAN, with a foreword by A. EDWARD NEWTON; first edition, 308 pages plus bibliography and index, illustrated, grey cloth, library label on back; Baltimore: The John Hopkins Press: 1935. Price, $2.50.

This is a memorial volume published by friends of LeRoy Crummer, M. D., former professor of medicine in the University of Nebraska School of Medicine, and former president of St. Catherine's Hospital in Omaha, Nebraska, who died on January 1, 1934, of coronary occlusion and aortitis. Dr. Crummer was famous throughout the Midwest and the nation as physician, artist, and collector of fine volumes. At the time of his death he was an associate editor of *The Annals of Medical History* and of *The American Heart Journal.* After graduation from the Northwestern University Medical School in 1896, Dr. Crummer spent a year as an interne at St. Barnabas Hospital in Minneapolis.

A Doctor's Odyssey is a very charming book, setting forth admirably the life and character of a physician who knew how to live to the fullest, and was yet unafraid of death when he knew it was upon him. Dr. Crummer appears to have been an unusually courageous man.

HANSEL ON ALLERGY

Allergy of the Nose and Paranasal Sinuses, by FRENCH K. HANSEL, M. D., M. S., green cloth, gold-stamped, 793 pages plus index, 58 textural illustrations with 3 color plates; Saint Louis, Missouri: The C. V. Mosby Company: 1936. Price $10.00.

This ponderous tome is described as *A Monograph on the Subject of Allergy as Related to Otolaryngology,* and doubtless will be a treasure trove of information to the specialist. Yet it is rather replete with details and unsolved issues which detract from its value to the general practitioner.

Individual chapters, on the other hand, are very illuminating, and are of much practical help. Particularly good are the sectional pollen surveys in the chapter devoted to Hay Fever and Pollens. The detailed discussion of therapy is also of decided practical value.

Dr. French is assistant professor of clinical otolaryngology in the Washington University School of Medicine at Saint Louis, Missouri. His book is essentially addressed to the specialist; but it has sections of general interest and value.

Raymond V. Ellis, M. D.,
Assistant Professor of Preventive Medicine,
University of Minnesota.

SNOW ON CHOLERA

Snow on Cholera, with an introduction by WADE HAMPTON FROST, M. D.; memorial edition, dark brown cloth, stamped in gold, 174 pages plus index and bibliography, illustrated; New York City: The Commonwealth Fund, 41 East 57th Street: 1936. Price, $2.50.

No chronicle of the rise of epidemiology can be valid and at the same time omit the name of John Snow, M. D. (1813-1858), who was born four years later than Abraham Lincoln, and died seven years before him.

No more brilliant investigation of the mode of transmission of cholera has ever been made than Snow's. His analysis of its epidemiology approaches the perfect model. Although it is now much easier to arrive at Snow's conclusion than it was in his day, the fact remains that his conclusion is still unassailable, and that he arrived at it years ago.

This volume reproduces two of his works: *On the Mode of Communication of Cholera* (1855), and *On Continuous Molecular Changes, More Particularly in Their Relation to Epidemic Diseases* (1853). Only a few copies of Snow's classic papers now exist, and the Commonwealth Fund has done the science of epidemiology a real service in producing this volume.

Physically, the book is surpassing. It is the work of Daniel B. Updike, of the Merrymount Press in Boston. It is set in Scotch, like the original second edition of *Mode of Communication,* and the cloth, binding, and blind-stamping are similar to that early edition. It is a very handsome volume.

13TH EDITION OF STEDMAN

Stedman's Medical Dictionary, by THOMAS LATHROP STEDMAN, A. M., M. D.; 13th edition, 1,235 pages plus appendix, many illustrations, thumb-indexed, black keratol; Baltimore, Maryland: William Wood & Company: 1936. Price, with thumb-index, $7.50; without thumb-index, $7.00.

The occasion of a new edition of Stedman is indeed auspicious. This dictionary has become almost standard authority wherever English is spoken in the civilized world.

Yet this 13th edition of Stedman is even more notable in that it contains all the changes made in the 11th edition of the *Pharmacopoeia* and the 6th edition of the *United States Formulary,* both of which appeared this year. It is pleasant to notice that Doctor Stedman has adopted the orthographical changes made in drug names by the *Pharmacopoeia i. e., sulfur* for sulphur).

The author does not believe that the new anatomical terminology evolved by the Anatomical Society of Great Britain and Ireland is sufficiently well-known at the present time to include it as an integral part of the text of this dictionary; but it is presented in the appendix in terms of the BNA. Probably it will be included in the next edition of this work.

The Journal-Lancet is pleased to recommend this new and much larger Stedman. It is a publication eminently worth its cost to any physician or student.

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A WORTHY ORGANIZATION

The Inter-Allied Professional Association of the state of South Dakota held its first meeting in Sioux Falls May 4—8, 1936. This Association was instituted through the 1934 Economics Committee of the State Medical Association. The groups composing the Inter-Allied Professional Association are the State Medical Association, the State Dental Association, the State Veterinary Association, the State Nurses' Association, the State Hospital Association, and the State Pharmaceutical Association. Before the annual meeting was held, an Inter-Professional Council was organized. This Council was composed of two members from each Association. Arrangements were made to have all of these associations hold their annual meetings in the same city during the same week. Each group conducted its own meeting independently and their headquarters and meeting places were separate. However, the various programs were prepared and grouped under one cover. This made it possible to present a very elaborate and imposing program. One day was set aside for a combined meeting of all the groups in the Coliseum. For this program, nationally and internationally known speakers were secured, such as Elliott P. Joslin of Boston; R. G. Leland of the American Medical Association; and E. F. Kelly of Washington, D. C. The various addresses were presented in a most effective manner and are being published in the JOURNAL-LANCET. The members of the various associations of the Inter-Allied Professional Association of South Dakota have as a common aim the welfare of the public health. The value of their cooperation in concentrating their efforts on problems and projects that are best for the public health is inestimable. Indeed, this movement, initiated in South Dakota, should be extended to every state in the Union.

J. A. M.

NURSES NOT OVERPAID

When the prefect of police, puzzling over some unsolved mystery, says "*Cherchez la femme,*" it must not be taken as an indictment of the woman. It does not mean to imply that she has been an accessory or even had guilty knowledge of the crime.

From the cradle to the grave, man has sought and received comfort at the hand of woman. It is a deep-seated instinct then that invariably directs the footsteps of troubled man. When he was a babe, his mother supplied his every want and crooned him to sleep. When he attains manhood, a good wife listens to a recital of his adversities with sympathy and infinite understanding. When sickness lays him low and the last scene on earth approaches, he is ministered to by a woman who has been trained in kind and gentle efficiency for just such an emergency. She is not one of the family but brought in from outside to do that which loving kinsmen are unqualified to perform. And yet she responds knowing full well that the assignment may be a tough one, that previously made plans and appointments must be cancelled, and that the time of service is indefinite —until recovery or *exodus vitalis.* After all her constancy and vigil, how cruel to say that the nurse is overpaid.

A. E. H.

PLACATING AND PLEASING THE PUBLIC

Lord Nuffield, the very wealthy English manufacturer of those small automobiles over there, recently resigned from the British Air Ministry, owing to some disagreement as to the policy of that Bureau. He was so disgruntled that, according to *Time,* he stated "God help England in case of war." He again comes into notice with the pleasing announcement that he has made a gift of about six million dollars to Oxford University for medical research; at the same time urging the beneficiary "to keep in close touch with developments in the sciences ancillary to medicine." In order to put the medical profession into the limelight, a leading New York daily waxes warm with the following editorial:

"Evidently Lord Nuffield perceives that the medical man of science more than any other searcher after truth tends to restrict himself to a narrow specialism. For example, physiologists know little of the rays, new and old, that destroy cells. Cytologists have little understanding of the part that enzymes—living catalysts— play in the growth of a tumor. Organic chemists rarely trouble to find out what pathologists and physiologists know about malignant growths. So it is with arteriosclerosis, arthritis and half a dozen diseases, all wrapped up in a darkness that is no credit to medical research. As an industrialist Lord Nuffield knows what cooperation can accomplish. What if all the resources of physics, chemistry, genetics and even mathematics were mustered in a combined attack on disease? There is every reason to believe that medical progress would be more rapid. It is not that the 'ancillary sciences,' —they are more than that—have been utterly neglected by medical research, but that they have not been systematically drafted into service by the lone hero of science, the genius of the laboratory, the single gifted virtuoso of cultures, vaccines and hormones. This is to be laid entirely to human limitations. Medicine, now a complex of many sciences, is too huge for one mind to master."

Before turning to another quotation, and that from an antimedical paper, one might question the knowledge possessed by the above writer as regards, for instance such institutions as the New York Cancer Hospital and the noted London Cancer Hospital; of the great work done in the past and yet continuing in our medical colleges, laboratories, institutions of research, not only under state or private endowments, but also in regard to those vast commercial institutions engaged in the study and the preparation of material for physicians' use; by means of which, plus the adoption of preventive medicine, thousands of deaths have been prevented.

As a contrast to the editorial, consider the following, which may be found in the Christian Science *Monitor* of date October 8, 1936: (While the writer of the *Monitor* article states that he is a *medical* doctor, he fails to give his name, exciting our curiosity by the initials S. G.)

Subsidized Vivisection

"In agreement with the letter of S. C. K., entitled 'Subsidized Vivisection," as a medical doctor I state it is the opinion of many doctors that it is indeed time that progress in human healing cease(s?) to be hampered by animal experiments. To date we have received no benefit. The results have been wrong conclusions and many fatal serum injections.

What shall we conclude when we know millions of dollars are invested in serum plants, and that many physicians are shareholders in them, although their names do not appear on the list of stockholders?

The tyranny of the Salem witchcraft pales before the demands of this medicopolitical organization." (Signed) New York, N. Y. "S. G."

Comments: (a) The physicians in these later years, by the use of modern methods and materials, have so reduced the death rate in the case of many contagious diseases, and also by preventive medicine are helping to almost eradicate such diseases as smallpox, diptheria, etc., that as a result the practice of many strictly medical doctors has dropped almost to *nil.*

(b) Why drag the Salem witchcraft affair into the discussion? It has long since been shown that much of the alleged data concerning the New England punishments was erroneous. Why not refer to Europe at large, and especially to Scotland, where even after the Witchcraft Law was repealed, some of the clergy loudly proclaimed its loss, and lamented that witches were yet rampant. (c) Medicine and Theology may and can at times blend; but don't compare us with witchfinders and persecutors. (d) I myself have no money in any serum plant, nor in any plant. In these days, the majority of physicians have neither money nor shares.

A. W. S.

WE ARE APPRECIATED

The average physician serves the public willingly, and without much thought of remuneration. Night or day, in all kinds of weather, and often at the risk of his life, he responds to calls from rich and poor alike; and if he receives enough for such services to afford himself a decent living, he is usually satisfied. Yet many times he wonders if his efforts are appreciated. Sometimes, he is even discouraged and cast down.

The writer is soberly of the opinion that the farmers and other folk of the Dakotas actually do appreciate the work of Dakota physicians. Let us refer briefly to an occurrence in South Dakota on the occasion of an address by a Dr. H. M. Allison (whose name appears in neither the *Directory* of the American Medical Association nor in *American Men of Science*), a gentleman who was scheduled to speak on giving tuberculin tests to cattle. Allison, a resident of Pittsburgh, Pa., was a guest speaker of the South Dakota Farmers' Union. But instead of adhering to his announced subject, he launched a terrific fusillade against the medical profession! The effect was electric. Allison was interrupted, asked to terminate his message, and the president of the Farmers' Union deplored the occurrence, at the same time emphasizing that the Farmers' Union has always had a high regard for the medical profession and its science.

This information, revealed by *The Sioux Falls Argus-Leader* not long since, indicates that our champions in the laity are not few in number, or impotent in defense. It is true that we receive few felicitations, and sparse praise. But our people are with us, and that, in any field of human endeavor, is almost sufficient unto itself.

J. L. S.

NEWS ITEMS

Dr. C. F. Dixon, Rochester, Minn., was recently elected president of Olmsted-Houston-Fillmore-Dodge County Medical Society. Dr. J. W. Helland, Spring Grove, vice president and Dr. M. C. Piper, Rochester, secretary.

Dr. J. A. Lamb, has been named chief of staff of the General Hospital at Kalispell, Mont.

Drs. M. J. Fardy and A. L. Cameron of Minot, were among the North Dakota physicians who attended the meeting of the American College of Surgeons held last month at Philadelphia.

Dr. A. O. Flom, Chisago City, Minn., while out on a hunting trip last month, died suddenly from a heart attack. The Doctor was 48 years of age and is survived by his widow.

Dr. R. H. J. Leigh, who has been in active practice at Tower City, N. D. for the past 12 years, passed away on the morning of October 22.

Dr. A. A. Laurent, a graduate of the University Medical School of Minnesota in 1911, and who had resided in Minneapolis all of his life, died recently after a short illness.

One of the well known physicians and surgeons of southwestern Minnesota, Dr. E. G. McKeown, Pipestone, Minn., was instantly killed, when his automobile skidded on a sleet covered road and struck a tree.

Over 1,000 nurses were in attendance at the Minnesota Nurses Association annual meeting recently held at St. Paul.

Dr. F. W. Behmler, formerly in practice at Appleton, has moved to Morris, Minn., and is now associated with Dr. C. E. Caine, of that city.

Dr. V. W. Embree, Carroll, Iowa, is now located at Onida, S. D. where he has opened offices for general practice.

Drs. W. J. and C. H. Mayo, Rochester were elected to the board of governors of the American College of Surgeons at its annual meeting recently held at Philadelphia.

The new officers of the Minnesota Academy of Medicine are Dr. T. S. Roberts, Minneapolis, president; Dr. E. M. Jones, St. Paul, vice president; and Dr. R. T. LaVake, Minneapolis, secretary.

The Minnesota State Board of Medical Examiners have closed the Class Vapo bath institute located in Minneapolis. They are to be commended for cleaning up these quackery systems.

Dr. L. D. Hughes who has been in active practice in Minneapolis, for the last 18 years, died suddenly in his office last month, while treating a patient. Dr. Hughes was a graduate of the University of St. Louis, Mo.

The November meeting of the Ramsey County Surgical Society, was addressed by Dr. F. W. Mayer of St. Paul, his subject being, "Preoperative Treatment of Diabetes."

Drs. Kenney and Henningson, Watertown, S. D. have recently enlarged their offices and are now domiciled in spacious and delightful new quarters.

Dr. Joseph G. Mayo, son of Dr. and Mrs. C. H. Mayo of Rochester, was killed on November 9, when his automobile was struck by a train on his return from a hunting trip.

Dr. A. Stolinsky, Lisbon, N. D. who has been accumulating from different languages medical anecdotes and humorous stories pertaining to medicine will publish them under the title of "Wit and Humor in the Medical Profession."

Dr. J. B. Darling, one of the veteran physicians of St. Paul, died suddenly on November 10, at the age of 77 years.

Dr. C. A. Houston, Park Rapids, Minn., succumbed to an attack of coronary thrombosis from which he had been ill only a few days. Dr. Houston had been in active practice in Park Rapids for the past 30 years, giving much of his time in the support of every worthwhile enterprise. He was graduated from the University of Minnesota in 1901.

Dr. T. L. Cockrell, Hinsdale, has purchased the equipment and practice of Dr. R. P. Minnick, of Saco, Mont.

Dr. G. W. Holt, Lake City, has purchased the practice of the late Dr. D. S. Fleischhauer, of Wabasha, Minn.

The House of Delegates of the Minnesota State Medical Association held a special session at St. Paul recently. The meeting was called to formulate and define principles and policies of organized medicine for submission to the interim committee of the state legislature, which is now engaged in shaping legislation to be introduced at the next session for the uniform and coordinating handling of social security, relief and welfare activities in the state. The committee was created by a resolution adopted at the 1935-1936 special session of the legislature.

The Montana medical society is a unit in its opposition to the passage of the measure empowering the state legislature to pass a six-hour law as the legal limit for which any Montana person may be employed. Dr. Byron Pampel, Livingston, former president of the Montana Medical Association and one of its leading spirits said, "We are opposed to it because such a provision is impractical and would work a hardship on the physicians and surgeons and others who administer to those humans in need of such services irrespective of the time of day or the number of hours which the doctor happens to have already been occupied during the current twenty-four hour period."

A Rolette County Medical Society was organized in Rolla, N. D. Dr. J. O. Hayhurst, Rolette, was elected president; Dr. B. D. Verret, Rolla, vice president; and Dr. M. Greengard, Rolla, secretary. The purpose of this organization is cooperation on local medical problems of the county doctors.

A sudden heart attack while he was attending to professional duties at his office caused the death of Dr. Monte A. Stern, 51 years old, prominent Sioux Falls physician and surgeon. Dr. Stern had lived since childhood, and practiced medicine in Sioux Falls for nearly a quarter-century.

He was at his office attending to a patient when the fatal attack occurred. His death came as a distinct surprise and shock to the community, as he had not complained of ill health, and was apparently feeling normal prior to the fatal seizure. Dr. Stern's sudden passing brought general expressions of regret not only from his colleagues in the medical profession here, but generally throughout the community.

The fall meeting of the North Dakota Academy of Ophthalmology and Oto-Laryngology was held at Fargo, October 31st, under the presidency of Dr. J. P. Miller of Grand Forks.

The following program was rendered:

"Tuberculin in Ophthalmology,"
Trygve Oftedal, M. D.—Fargo
"Osteomyelitis of the Facial Bones and Skull, with Case Report."
Geo. C. Foster, M. D.—Fargo
"Practical Optics."
Clarence Wulling, Minneapolis

The Minnesota State Medical Association broadcasts weekly at 1:45 o'clock every Wednesday morning over station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters). Speaker: William A. O'Brien, M. D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows: December 2—Marking Babies, December 9—The Use of Cosmetics, December 16—Weight Control, December 23—The Winning Fight, December 30—Your Teeth— A New Year Resolution.

The annual meeting of the Sioux Valley Medical Association will be held at Sioux City, Iowa on January 19 and 20. The program is not yet complete, but will be mailed to all members at an early date. Among the many prominent physicians that will present papers, are: Dr. Carl Meyer, Chicago, "Surgery"; Dr. Fremont Chandler, Chicago, "Orthopedics"; Dr. Joseph Baer, Chicago, "Obstetrics and Gynecology"; Dr. W. F. Braasch, Rochester, "Urology"; Dr. R. J. L. Kennedy, Rochester, "Pediatrics"; Dr. H. M. Korns, of Iowa City, in "Internal Medicine"; Dr. C. W. Poynter, Omaha, Dean of the University of Nebraska Medical School.

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